

**Q CLAUSES
PROCUREMENT QUALITY REQUIREMENTS SYSTEMS
1991**

1.0 PURPOSE

This document establishes the Procurement Quality Requirements (Q-Clauses), which are applicable to the extent specified in the procurement document.

2.0 DEFINITIONS

- 2.1 **Buyer:** Northrop Grumman Procurement entity
- 2.2 **Seller:** The legal entity that is the contracting party with Buyer with respect to the procurement document.
- 2.3 **Procurement Document:** The purchase order or subcontract between the parties.
- 2.4 **Item:** The product or service contracted for by the procurement document.

3.0 PROCUREMENT QUALITY REQUIREMENTS

The following Q-Clauses are a requirement of the procurement document when expressly specified by Q-clause number.

Q001 GENERAL QUALITY ASSURANCE REQUIREMENTS

A. PROHIBITED PRACTICES AND NOTIFICATION REQUIREMENTS

Unauthorized Repairs: Unless specifically approved by governing specification, during the manufacturing of any item, Seller shall not repair any damaged item, any item found to be faulty, or any item that fails to meet Buyer specification/drawing requirements, without Buyer's prior written approval. Seller is not authorized to perform Material Review Board (MRB) activity on non-conforming material without Buyer authorization.

Change in Approval, Drawing, Processes, Materials, or Procedures: Seller shall not change any drawing, process, material (including subtier supplier parts), or procedure without prior Buyer written approval, if such drawing, process, material, or procedure was previously approved by Buyer as provided for in the procurement document.

Seller shall not change any process, material or procedure that was used to qualify any item, or which was used by Seller to become a qualified source for Buyer specification/drawing, without Buyer written approval.

Resubmittal of Rejected Items: Any item rejected by Buyer and subsequently resubmitted to Buyer shall be clearly identified as a resubmitted item, indicating procurement document number and Buyer reject document number in Seller's Certificate of Conformance.

Notification of Facility Change: Seller shall not use nor relocate any production, manufacturing, and/or processing facilities to differ from previous approval by Buyer, during performance of work specified in the procurement document, without previously notifying Buyer and affording Buyer an opportunity to examine such facilities for compliance with Procurement Quality Requirements.

Changing of Test Facility: Seller shall not change a test facility nor use another test facility to meet specification/drawing requirements without prior Buyer written approval, if a specific test facility was previously approved by the Buyer as provided for in the procurement document.

Change of Management/Owner: Seller shall notify Buyer when a significant change in management or ownership has occurred.

Change to Third-Party Registration/Accreditation: Seller shall notify Buyer when any change has occurred to Seller's Third-Party AS9100, ISO9001 and/or Nadcap registration.

Seller shall provide Buyer with a copy of Seller's Certificate of Accreditation. Upon expiration and/or change in Seller's accreditation status (including name and/or ownership change), the Seller shall provide Buyer with a current certificate.

B. RESPONSIBILITY FOR CONFORMANCE

Neither surveillance, inspection and/or test made by Buyer or its representatives or US Government representatives at either Seller's or Buyer's facility shall relieve Seller of the responsibility to furnish an item that conforms to the requirements of the procurement document.

C. BUYER SURVEY, SURVEILLANCE, AUDITS AND INSPECTION

Buyer, Buyer representative, Buyer Customer, US Government and/or regulatory agencies have the right to conduct surveys, audits and surveillance of Seller facilities, and those of Seller subtier suppliers with prior coordination with Seller, to determine capability to comply, and to verify continuing compliance, with the requirements of the procurement document. Objective evidence of Seller's compliance, either by submittal of requested evidence, or evidence of a third party accreditation, may be acceptable for the purpose of re-survey, but will not preclude the use of on-site evaluations or other review methods.

The Seller shall permit Buyer access to all data on the International Aerospace Quality Group's (IAQG) OASIS website and Nadcap database such as registration documentation, audit reports findings, corrective action, etc. The Seller shall provide notice to their NGSSD Quality Field Engineer of any major changes in the key personnel, organizational structure or manufacturing processes affecting quality and/or any major findings uncovered during their registrar's periodic audits within 7 business days. Corrective and Preventive actions taken in response to those major finding shall also be provided to NGSSD Quality Field Engineer. The Seller shall also permit Buyer access to all data relating to management of the Quality System such as internal audit results and their corrective and preventive actions, and results of management reviews.

Buyer has the right to perform inspection at Seller facilities and those of Seller subtier supplier with prior coordination with Seller, during the period of manufacturer and inspection prior to shipment. Final inspection, and acceptance, shall be performed at the Buyer facility, unless otherwise specified in the procurement document.

Buyer reserves the right to use ANSI/ASOCZ1.4, Sampling Procedure and Tables for Inspection by Attributes," or other sampling process for the acceptance or rejection of items.

When Q-Clause Q06x or Q06xx is annotated on the purchase order, Seller conformance to Buyer requirements shall be verified by Buyer Quality Field Engineer (QFE) prior to

shipment of items being procured. Seller shall provide reasonable facilities and a copy of Buyer's specification/drawing and the procurement document for Buyer verification of Seller conformance to the procurement document and specification/drawing requirements. Buyer Source Inspection may include, but is not limited to the following: • Validation of Seller automated test programs and procedures to Buyer's specification/ drawing requirements (when applicable).

- Witnessing Seller's performance of acceptance/qualification testing and inspections to Buyer's specification/drawing requirements. Seller may be requested to perform an additional 1.0 AQL acceptance test/inspection when Buyer's Quality Field Engineer has not witnessed Seller acceptance testing.
- Review of Seller acceptance test/inspection data and reports to verify conformance with Buyer's specification/drawing requirements.
- Review of lot qualification test data to Buyer's specification/drawing requirements, if applicable.
- Verification of Seller's packaging and packing of items being procured to ensure conformance with Buyer's procurement document or specification/drawing requirements.
- Verification of item traceability and Seller's certification to ensure conformance with Buyer's procurement document or specification/drawing requirements.

Seller shall provide inspection/test data and reports to Buyer's Quality Field Engineer indicating which characteristics, parameters, dimensions, etc., were actually tested/inspected for validation to Buyer's specification/drawing requirements.

For Customer Source Inspection (CSI), please allow for five (5) M-Days in your manufacturing spans for each CSI request. Notify your local Quality Field Representative (QFR) once the hardware is ready for inspection. The QFR will get back to you to schedule a time and day to perform the inspection. Please do not request CSI until the hardware is ready. Re-scheduling CSI due to hardware not being ready may result in the issuance of a Corrective Action Request (CAR). To ensure the right QFR performs the CSI, please request the QFR's contact information from your NGC Buyer.

After Buyer Source Inspection, any rework or test of the item(s), including any unscheduled or unauthorized entry, such as removal of a panel, cover, or enclosure shall void the Buyer Source Inspection and Seller shall request Buyer to repeat applicable Source Inspection step(s).

D. DOCUMENTATION

Buyer may refuse to accept item if Seller fails to submit certifications, documentation, test data or reports specified by the procurement document. Documentation includes Buyer Source Inspection if such source inspection is performed. Any change to the documentation shall be made per industry standards such as AS9100 and should follow the format of a single line striking out the incorrect information. Adjacent to the strikeout place the correct information, a date indicating the date of the change and an initial or stamp indicating the person making the change.

E. CORRECTIVE ACTION REQUEST

When a quality problem exists with any Seller item, Buyer may forward a "Corrective Action Request" to Seller, requiring timely response that shall include the following information: analysis of the cause of the problem; statement of the action taken to prevent recurrence; and the effectiveness of the action. When corrective action is required for U.S. Government source inspected items, Seller shall coordinate such action with the U.S. Government Quality representative assigned to administer Seller Facility. Note: Delegated Suppliers are not exempt from on-site verification of corrective action.

F. U.S. GOVERNMENT SOURCE INSPECTION

For procurements made under U.S. Government contracts, the US Government has the right to inspect any and all of the work included in the procurement document, at Seller facilities or at subtier supplier facilities. Seller Quality Control or inspection system and manufacturing processes are subject to review, verification and analysis by authorized U.S. Government representatives.

G. MEASURING AND TEST EQUIPMENT

Seller shall be responsible for validating the accuracy and stability of tools, gages and test equipment used to demonstrate that any item conforms to the requirements specified by the procurement document.

Documented schedules shall be maintained to provide for periodic calibration to adequate standards. Objective evidence of calibrations shall be recorded and made available for Buyer review. Seller's calibration system should be compliant to ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment"; ANSI Z540-1, "General Requirements for Calibration Laboratories and Measuring and Test Equipment," MIL-STD-45662, "Calibration System Requirements," or comparable standards.

H. NONCONFORMING MATERIAL

Any decision to accept any nonconformance (variance from Buyer drawings and specifications), detected at Seller facilities, must be made by Buyer unless otherwise specified by the procurement document. Shipment of any non-conforming item shall be accompanied by Buyer-approved Supplier Material Review Record (SMRR), using MES-NC portal on OASIS.

Seller shall provide for identification, control and segregation of non-conforming material detected at Seller facilities.

I. RETENTION OF QUALITY RECORDS

The Seller shall maintain and make available to the Buyer (or Buyer's representative) for review all Quality Records associated with inspection, test and reviews associated with the Seller's Quality Management System (QMS).

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Seller shall have a procedure for the retention, identification, storage and retrieval of Quality Records for a minimum period of 7 years from the date of the last shipment of purchase order or as required per contract or regulatory requirements. Quality Records shall include, but are not limited to:

- Evidence of inspection to applicable drawings or specifications
- First Article Inspection Report
- Test reports
- Periodic inspection and control of inspection media
- Records to indicate control of Special Tooling and Special Test Equipment
- Test data records of all qualifications and acceptance tests performed
- Certification of personnel required by specification and/or contract
- Raw material and process specifications
- Material Review Reports

The Seller shall also impose these requirements upon their sub-tier suppliers.

J. SAMPLE INSPECTION

Seller may use sample inspection plans, when tests are destructive, or when the records or inherent characteristics of the product indicate that a reduction in inspection/testing can be achieved without jeopardizing product quality. Sample inspection shall be in accordance with the applicable Buyer specification. When not specified by Buyer, other sampling plans (e.g. from ANSI/ASQCZ1.4, or ANSI/ASQCZ1.9) may be used. The Buyer prior to their implementation shall approve other sample inspection plans. All sample inspection plans shall provide valid confidence in specified Quality levels.

K. SELLER'S BASIC CERTIFICATE OF CONFORMANCE

Acceptance of this purchase order indicates compliance to the requirements of Q-Clause Q001 A through P and compliance to the following elements:

1. The items furnished per the Buyer procurement document have been manufactured, tested and inspected in accordance with the requirements of the applicable specifications/drawings and the results of such tests and inspections meet the requirements thereof.
2. That Buyer-required inspections and tests have been performed utilizing calibrated equipment.
3. All material used in items furnished meet the applicable specification/drawing requirements specified by the procurement document.
4. Any specification requirements identified in support of this purchase order shall be done to the revision at the time of PO placement unless otherwise negotiated.
5. If a Request for Change/Information (RC/I) was submitted and dispositioned, add the RC/I number(s) to the packing slip and provide a copy of the RC/I(s) with the shipment.

Seller certificate of conformance shall include, at a minimum, supplier name and location, Northrop Grumman part number, serial number (if applicable), revision level, and Northrop Grumman purchase order number. Seller's certificate of conformance, and any additional documentation required per associated engineering drawings/specification or required per quality clauses contained on the purchase order, shall be provided with each shipment.

L. DLA QML BASIC CERTIFICATE OF CONFORMANCE (MIL-PRF-38535 AND MIL-PRF-38534)

Manufacturers or Sellers, including Distributors, who offer QML microcircuits described by MIL-PRF-38535, "Performance Specification – Integrated Circuits (Microcircuits) Manufacturing, General Specification For" & MIL-PRF-38534, "Performance Specification – Hybrid Microcircuits, General Specification For," shall provide written certification to Buyer as required by MIL-PRF-38535, paragraph 3.2.1 & MIL-PRF-38534, paragraph 3.10.1.

M. COUNTERFEIT PART PREVENTION

If the Seller is a Distributor, this section, Q1M, does not apply and the Seller/Distributor shall meet the requirements of Q24 when specified on the procurement document.

As part of a counterfeit part prevention practice, Seller shall ensure that all material/components included in hardware being delivered per this procurement document have been procured directly from an Original Equipment Manufacturer (OEM) or a first-tier OEM authorized Distributor. For items procured from an OEM or a first-tier OEM authorized Distributor, the Seller shall provide the OEM name, authorized Distributor name (as applicable), part number, lot number, serial number, and/or date code of items shipped. If the Seller cannot procure the part directly from the OEM or a first-tier OEM authorized distributor, Buyer approval is required. Seller shall maintain a method of traceability that ensures tracking of the supply chain back to the OEM manufacturer and shall supply records of this traceability to Buyer upon request.

N. SUBTIER SUPPLIER CONTROL

Seller shall control subtier supplier procurements to the extent necessary to ensure Quality Requirements specified in the procurement document are satisfied. Quality Requirements may include, but are not limited to, the following:

- All items procured from its subtiers conform to all requirements of the Northrop Grumman purchase order
- All applicable provisions of this purchase order are flowed to its sub tiers including copies of the latest revision process specifications
- Specify on their purchase order for special processes "Northrop Grumman Strategic Space Systems Division" as your customer and include the applicable Program Identifier, e.g., AMPXX, AEHFX, etc., or Program Name such as, AMP, Advance EHF. The Program Identifier or Program Name can be found on your Northrop Grumman Purchase Order.
- Sub-tier supplier Quality Systems shall be compliant to the requirements of either ISO9001:20xx, AS9100, AS9120 or AS9003. (3rd Party Certification not required).
- Subtier supplier pre-award survey/evaluations
- Periodic auditing of subtier supplier
- Implementing a subtier supplier rating system

- Ensuring adequate review of procurement documentation prior to procurements controlling procurement of critical items for Seller product
- Inspection of procured items to documented procedures
- Control of non-conforming material, including corrective action

O. DISCLOSURES / NOTIFICATIONS

The supplier's system shall provide for timely reporting of nonconformities that may affect already delivered product. Notification to the Buyer/Subcontract Administrator (SCA) shall be submitted on company letterhead and include a clear description of the discrepancy, and identification of all suspect parts (to include Northrop Grumman part numbers, Purchase Order Numbers and Item Numbers, serial numbers, manufacturing dates, quantities, etc.) and material affected by the deficiency, date(s) delivered, any information relating to the Root Cause / Corrective Action steps initiated to address the defective condition, and preventive measures taken to preclude recurrence of the process failure. Modifications of a disclosure (additions or deletions of data) requiring subsequent issuances shall be revision controlled to provide definitive sequencing (i.e., Rev 'A', 'B' etc.). To expedite the return of "suspect" or known nonconforming hardware to supplier for investigation, and necessary repair or replacement, suppliers shall provide Return Material Authority (RMA) Number(s) along with the disclosure.

Suppliers shall ensure that their Quality Management System has the capability to report nonconformance(s) on Critical Safety Items (CSI) in full compliance with Defense Federal Acquisition Regulation Supplement (DFARS) 252.246-7003.

For suppliers with Design Authority, a technical assessment and recommended disposition shall be provided.

This disclosure process shall also be extended to an issuance of a DCMA issued Corrective Action Request (CAR) to the supplier for Northrop Grumman material. Notification to the Buyer/SCA shall be submitted on company letterhead and include identification of the material above in addition to any manufacturing, processing, testing, Quality System or other deficiencies cited. Copies of the initial CAR and subsequent responses necessary to close the CAR shall be sent to the Buyer/SCA with the Notification letters.

The supplier's system shall be extended to and provide for timely reporting of:

- DCMA issued Corrective Action Request (CAR) to the supplier affecting Northrop Grumman material
- Subtier supplier disclosures provided to the Seller affecting Northrop Grumman material
- GIDEP or other industry alerts affecting or that may potentially affect the Seller's products delivered to Northrop Grumman
- Nonconformities of Northrop Grumman furnished or consigned material

P. GIDEP ALERTS

Suppliers of Electrical, Electronic and Electromechanical (EEE) parts/hardware must be a member of GIDEP, if eligible, and take appropriate corrective and preventive actions on all suspect or defective material or suspect counterfeit or counterfeit parts reported by GIDEP alerts. Access to GIDEPs can be viewed at www.gidep.org/gidep.htm. The supplier must ensure that all occurrences where it has:

1. Acquired suspect or defective material or suspect counterfeit or counterfeit parts are reported to GIDEP.
2. Provided suspect or defective material or suspect counterfeit or counterfeit parts are immediately reported to the Buyer.

Q06A1 BUYER IN-PROCESS INSPECTION

Seller performance of in-process operations to Buyer requirements shall be verified by Buyer Quality Field Engineer during item manufacture **prior to encapsulation/conformal coating**.

Q06A2 BUYER IN-PROCESS INSPECTION

Seller performance of in-process operations to Buyer requirements shall be verified by Buyer Quality Field Engineer during item manufacture **prior to cleaning**.

Q06A3 BUYER IN-PROCESS INSPECTION

Seller performance of in-process operations to Buyer requirements shall be verified by Buyer Quality Field Engineer during item manufacture **prior to plating**.

Q06A4 BUYER IN-PROCESS INSPECTION

Seller performance of in-process operations to Buyer requirements shall be verified by Buyer Quality Field Engineer during item manufacture **prior to assembly close-up**.

Q06A5 BUYER IN-PROCESS INSPECTION

Seller performance of in-process operations to Buyer requirements shall be verified by Buyer Quality Field Engineer during item manufacture **at other points specified by the procurement document**.

Q06A6 BUYER IN-PROCESS INSPECTION

Seller performance of in-process operations to Buyer requirements shall be verified by Buyer Quality Field Engineer during item manufacture **at other points specified in the Process Identification Document**.

Q06A7 BUYER IN-PROCESS ENGINEERING ASSESSMENT

Seller performance of in-process operations to Buyer requirements shall be witnessed by Buyer Engineering support during item manufacture. **The Engineering point of contact and the in-process operation to be witnessed shall be specified by the procurement document**.

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Q06B BUYER AUDIT/PROCESS VERIFICATION

Buyer audit of Seller process operations by Buyer Quality Field Engineer shall include, but is not limited to, the following:

- Verification that Seller is maintaining a Quality System that has been previously approved by Buyer.
- Verification that Seller's flow down of requirements to subtler suppliers is adequate to meet Buyer's requirements.
- Verification that Seller's work instructions are adequate to ensure implementation of Buyer's requirements.
- Verification that Seller's manufacturing processes is under control to ensure product quality, configuration control and traceability to meet Buyer's requirements.
- Verification that Seller is maintaining proper control of non-conforming material and taking corrective action, as required.

Q06C BUYER PRECAP INSPECTION

Items of this procurement document require pre-cap inspection by Buyer Quality Field Engineer subsequent to the 100 percent pre-cap visual inspection performed by Seller.

Q06D BUYER SCANNING ELECTRON MICROSCOPE ANALYSIS

Buyer approval of Scanning Electron Microscope (SEM) analysis shall be required for wafer lots to be incorporated in parts supplied to Buyer Quality Field Engineer. The SEM analysis shall be performed by Seller and must be approved by Buyer prior to the incorporation of wafers in parts.

Q06E BUYER SOURCE SURVEILLANCE

Buyer Quality Field Engineer shall perform surveillance at Seller's facilities during the contract period. Surveillance shall be scheduled by Buyer and coordinated with Seller prior to implementation. Surveillance activities shall include, but is not limited to, the following:

- Auditing Seller's procurement, manufacturing, test and inspection, configuration control, and non-conforming material control procedures and processes.
- Witnessing of product acceptance/qualification testing.
- Review of Seller's test/inspection data and reports to verify conformance to procurement document requirements.

Q06F BUYER SOURCE INSPECTION FOR PROCUREMENT TO ANOTHER CONTRACTOR'S PART NUMBER/SPECIFICATION

Buyer Source Inspection shall consist of verification of another contractor's inspection data to ensure that items have met the other contractor's specification requirements when Buyer procurement document specifies contractor's part number. Seller shall provide copy of other contractor's source inspection report/data containing results of other contractor's inspection. Whenever other contractor's source inspection report/data is/are not available, the Seller's inspection traveler, indicating other contractor's test/inspection acceptance may be used for verification. Inspection verification review shall be performed at Seller facility prior to shipment.

Q06G BUYER FINAL SOURCE INSPECTION

Items of this procurement require final inspection by Buyer Quality Field Engineer (QFE). After the successful completion of final inspection performed by Seller, notify your local QFE that hardware is ready for inspection. When the procurement document authorizes shipment of parts prior to completing Quality Conformance Inspection (QCI) additional Buyer Source Inspection is required for QCI samples and data unless otherwise documented on the procurement document.

Q06GX BUYER FINAL SOURCE INSPECTION NOT REQUIRED

Do not call for Source Inspection. This quality clause takes precedent over Q6G. After the successful completion of final inspection performed by Seller, the Seller is authorized to ship product to the Buyer.

Q06H BUYER SOFTWARE AUDITS

Buyer shall perform audits, review and/or verification at Seller's facilities during the development and test of software to be furnished on this procurement.

Q06J BUYER FINAL SOURCE DATA REVIEW

Items of this procurement require End Item Data Package (EIDP) review by Buyer Quality Field Engineer (QFE). After the successful completion of final inspection performed by Seller, provide an electronic copy of the EIDP to the Buyer QFE prior to shipment to Northrop Grumman. Buyer QFE shall provide a Quality Field Inspection Report (QFIR) noting acceptance of items and authorization to ship.

Q009 U.S. GOVERNMENT SOURCE INSPECTION (NASA)

All work under the procurement document is subject to inspection and test by the U.S. Government any time and place. The U.S. Government representative who has been delegated NASA Quality Assurance functions for the procurement document shall be notified immediately upon receipt thereof. The U.S. Government representative shall also be notified three (3) working days in advance of the time the items are ready for inspection or test. In the event that the U.S. Government Representative cannot be contacted, Seller shall notify Buyer immediately.

Seller, without additional charge to the procurement document, shall provide all reasonably required facilities and assistance for convenience and safety of the U.S. Government Representatives in the performance of their duties.

Q010 U.S. GOVERNMENT SOURCE INSPECTION (DOD)

U.S. Government Source Inspection is required prior to shipment from Seller's facility. Upon receipt of this procurement document, Seller shall immediately notify and provide a copy of the procurement document to the U.S. Government representative who normally services the Seller's facility, so that appropriate planning for U.S. Government Source Inspection can be accomplished. If a U.S. Government Representative does not normally service the Seller's

facility, the nearest Army, Navy, Air Force, or Defense Agency inspection Office shall be contacted. In the event that a U.S. Government representative cannot be contacted, Seller shall notify Buyer immediately. Seller, without additional charge to the procurement document, shall provide all reasonably required facilities and assistance for convenience and safety of the U.S. Government Representatives in the performance of their duties.

Q013A METALLIC RAW MATERIAL DOCUMENTATION REQUIREMENTS

Shipment of materials whether raw, semi-finished or finished, shall be accompanied by a Certificate of Conformance from Seller, stating at a minimum:

- Material identification by specification number, and material conditions where applicable.
- The raw material manufacturers or mills lot or batch number.
- A statement of raw material conformance to applicable requirements.
- The name and location of the raw material manufacturer or mill.

All raw metals shall be procured directly from a Mill or shall show full traceability from the Mill, that produced the final product size, through any subsequent processing steps, including actual chemical/physical test results and/or inspection on the final "as delivered" material form/size showing full compliance to the material's specification requirements.

Q013B METALLIC RAW MATERIAL ADDITIONAL TESTING

All items defined in Q13A.

Seller shall provide independent test results that substantiate compliance with chemistry, tensile, and hardness requirements as applicable per raw material and/or specification requirements.

Q013C HIGH STRENGTH FASTENER TESTING REQUIREMENTS

This procurement document requires compliance with Buyer document D32656 for third party testing of high strength fasteners.

Q015 CONTROL OF PROCESSES

Process specifications called out in either Engineering drawings, other process specifications or purchase orders, require NG-SSSD approval when they are listed in Northrop Grumman Approved Special Processors List (ASPL) at the time of purchase order release. Suppliers shall ensure that the processing source performing the work, including the supplier themselves or sub-tier service providers, is approved and listed on the ASPL for that process specification prior to processing of each lot of hardware. Suppliers shall validate this by reviewing the ASPL whenever they get a new purchase order from Northrop Grumman or whenever they start to process a new lot of hardware. The NG-SSSD ASPL can be found at the following link (<https://oasis-aspl.mvngc.com>). A Certificate of Conformance to the process specification requirements shall be provided with the shipment.

For the purposes of special processes, the supplier is considered the "buyer" of those services as it pertains to acceptance of the special process contracted out to other approved processing sources. The processing source shall be accountable for the applicable "supplier" responsibilities identified in the special process specification. NGSSSD as the ultimate buyer shall retain responsibility for all qualification activities.

Q016 TEST DATA

When Buyer specification requires test data to be recorded during performance of acceptance testing, a copy (paper or electronic) of the recorded data, showing evidence of Seller's inspection and verification of conformance, shall accompany shipment of items to Buyer. Shipment of data on non-paper, CD ROM/disk is desirable. Data shall meet the format requirements of Buyer specification and, as a minimum, be identified with:

- Buyer's procurement document number and applicable change notice number.
- Buyer's specification/drawing number and revision letter.
- Buyer's engineering order(s).
- Part number.
- Type of test performed.
- Lot number, serial numbers, and/or codes of items tested.
- Total quantity tested, quantity accepted and quantity rejected.
- Any codes, keys or other information necessary to interpret Seller's data.

Q018 RADIOGRAPHIC INSPECTION

Seller must be approved by Buyer to perform the radiographic inspection applicable to this procurement document or shall use a radiographic facility approved by Buyer. Buyer shall provide a list of approved radiographic facilities upon request. If Seller wishes to use an unapproved facility, prior authorization must be requested and received from Buyer. The facility performing the radiographic inspection, whether the Seller's or a subtler to the Seller, must be approved by Buyer at the time the actual radiographic inspection takes place. The Seller shall ensure prior to shipment to Buyer that the facility performing the radiographic inspection was approved by Buyer at the time of use.

The Seller must have at their Facility the necessary equipment to review and evaluate the x-ray film, or electronically saved images from real time x-ray, per ASTM E 1742, "Standard Practice for Radiographic Examination."

Equipment must be calibrated per ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment" or ANSI Z540-1, "General Requirements for Calibration Laboratories and Measuring and test Equipment" or equivalent as approved by the Buyer.

Unless otherwise specified by the parts specification, each radiograph shall comply with ASTM E 1742 "Standard Practice for Radiographic Examination, MIL-STD-883 "Test

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Method and Procedures for Microelectronics," MIL-STD-750 "Test Method for Semiconductor Devices."

The radiographic film or electronically recorded real time image (jpg or tiff format only) shall accompany the shipment of the items to the Buyer (hard copy print out of electronically recorded real time images are not acceptable). Serial number location, x-ray orientation and electronic position must be recorded. A final report shall be provided in .pdf format.

Q024 COUNTERFEIT PART PREVENTION FOR DISTRIBUTORS AND MANUFACTURERS

Cancelled. This quality clause has been replaced with Q024A, Q024B, and Q024C. When this clause is included in the purchase order, the applicable requirements of Q024A, Q024B, or Q024C shall apply based on the product being supplied.

Q024A COUNTERFEIT PART PREVENTION FOR EEE HARDWARE

Original Component Manufacturer:

The Original Component Manufacturer shall provide a Certificate of Conformance including: the procurement document, the manufacturer name, location, part number, lot number, serial number, and/or date code of each item shipped.

Distributor (supplier other than the manufacturer):

The distributor shall have a counterfeit detection process that complies with SAE standard AS5553, "Counterfeit Electronic Parts, Avoidance, Detection, Mitigation, and Disposition." Companies shall have a counterfeit parts program plan to ensure it does not receive counterfeit parts into inventory, use them in manufacturing, or inadvertently sell them to other parties.

As part of a counterfeit part prevention practice, the distributor shall procure directly from the Original Component Manufacturer (OCM) or a first-tier OCM authorized distributor. If the distributor cannot procure the part directly from the OCM or a first-tier OCM authorized distributor (i.e., part obsolescence issue), Buyer approval is required.

The distributor shall identify the following on the Certificate of Conformance: the procurement document, the original manufacturer name, location, part number, lot number, serial number, and/or date code of each item shipped. Seller shall also provide the original Certificate of Conformance received from the OCM.

Electronic Assembly Suppliers (provider of assemblies containing EEE parts):

The electronic assembly supplier shall have a counterfeit detection process that complies with SAE standard AS5553, "Counterfeit Electronic Parts, Avoidance, Detection, Mitigation, and Disposition." Companies shall have a counterfeit parts program plan to ensure it does not receive counterfeit parts into inventory, use them in manufacturing, or inadvertently sell them to other parties.

As part of a counterfeit part prevention practice, Seller shall ensure that all material/components included in hardware being delivered per this procurement document have been procured directly from an Original Component Manufacturer (OCM) or a first-tier OCM authorized distributor. If the Seller cannot procure the part directly from the OCM or a first-tier OCM authorized distributor, Buyer approval is required.

Seller shall maintain a method of traceability that ensures tracking of the supply chain back to the OCM manufacturer and shall provide the original Certificate(s) of Conformance received from the OCM. The Certificate(s) of Conformance shall include: the procurement document, the OCM name, authorized distributor name (as applicable), part number, lot number, serial number, and/or date code of items shipped.

Q024B COUNTERFEIT PART PREVENTION FOR ELECTRONIC HARDWARE

Original Component Manufacturer:

The Original Component Manufacturer shall provide a Certificate of Conformance including: the procurement document, the manufacturer name, location, part number, lot number, serial number, and/or date code of each item shipped.

Distributor (supplier other than the manufacturer):

The distributor shall have a counterfeit detection process that complies with DFAR 252.2467007, "Contractor Counterfeit Electronic Part Detection and Avoidance System." Companies shall have a counterfeit parts program plan to ensure it does not receive counterfeit parts into inventory, use them in manufacturing, or inadvertently sell them to other parties.

As part of a counterfeit part prevention practice, the distributor shall procure directly from the Original Component Manufacturer (OCM) or a first-tier OCM authorized distributor. If the distributor cannot procure the part directly from the OEM or a first-tier OCM authorized distributor (i.e., part obsolescence issue), Buyer approval is required.

The distributor shall identify the following on the Certificate of Conformance: the procurement document, the original manufacturer name, location, part number, lot number, serial number, and/or date code of each item shipped. Seller shall also provide the original Certificate of Conformance received from the OCM.

Electronic Assembly Suppliers (provider of assemblies containing EEE parts):

The electronic assembly supplier shall have a counterfeit detection process that complies with DFAR 252.246-7007, "Contractor Counterfeit Electronic Part Detection and Avoidance System." Companies shall have a counterfeit parts program plan to ensure it does not receive counterfeit parts into inventory, use them in manufacturing, or inadvertently sell them to other parties.

As part of a counterfeit part prevention practice, Seller shall ensure that all material/components included in hardware being delivered per this procurement document have been procured directly from an Original Component Manufacturer (OCM) or a first-tier OCM authorized distributor. If the Seller cannot procure the part directly from the OCM or a first-tier OCM authorized distributor, Buyer approval is required.

Seller shall maintain a method of traceability that ensures tracking of the supply chain back to the OCM manufacturer and shall provide the original Certificate(s) of Conformance received from the OCM. The Certificate(s) of Conformance shall include: the procurement

document, the OCM name, authorized distributor name (as applicable), part number, lot number, serial number, and/or date code of items shipped.

Q024C COUNTERFEIT PART PREVENTION FOR NON-EEE HARDWARE

Original Equipment Manufacturer:

The Original Equipment Manufacturer shall provide a Certificate of Conformance including: the procurement document, the manufacturer name, location, part number, lot number, serial number, and/or date code of each item shipped.

Distributor (supplier other than the manufacturer):

The distributor shall identify the following on the Certificate of Conformance: the procurement document, the original manufacturer name, location, part number, lot number, serial number, and/or date code of each item shipped. Seller shall also provide the original Certificate of Conformance received from the OCM.

Assembly Suppliers (provider of assemblies not containing EEE parts): Seller shall maintain a method of traceability that ensures tracking of the supply chain back to the Original Equipment Manufacturer (OEM) and shall provide the original Certificate(s) of Conformance received from the OEM. The Certificate(s) of Conformance shall include: the procurement document, the OEM name, authorized distributor name (as applicable), part number, lot number, serial number, and/or date code of items shipped.

Q025 SELLER INSPECTION REPORTING REQUIREMENTS

Seller shall submit, with each shipment of items, a report reflecting 100 percent inspection verification of all drawing characteristics for each product type delivered. The seller's report shall be divided and organized into sections indicating the verification of all Part Dimensions, Drawing Notes, Materials, Processes, Finishes, Installed Items (Inserts, Dowel Pins, Nut Plates, etc.), and Source Control Requirements. A check mark shall be used to address each general note to indicate that the general note requirements are in compliance. All required certifications and/or test report traceability numbers shall be listed on the report and certification copies shall be included as part of the seller's data package.

Check marks may be used for verification of Part Dimensions that reference a general tolerance block or general note referring to all dimensions on a drawing for which tolerances are not otherwise specified. Actual measurement results shall be provided for Part Dimensions with defined tolerances on the face of the drawing. For Part Dimensions with defined tolerances, the report shall delineate each drawing characteristic with the corresponding actual measurement results for the First and Last part produced when hardware is produced via CNC Machining or Automated Processing Set up. For items machined/manufactured under non-CNC or Operator dependent processing, where the processing can vary from unit to unit, actual measurements shall be reported for Part Dimensions with defined tolerances on all units in the order. 100% verification for 100% of the parts is required on all Threaded Features including Non-Locking Inserts. The report shall include the type of measurement equipment and a unique identifying number of actual equipment used for the inspection.

Form P0-F283 ([Link to Form P0-F283, Detailed Data Sheet](#)), an AS9102 checklist or equivalent supplier form may be used to capture the inspection report, provided that all elements of those forms are included.

Q026 SUPPLIER FIRST ARTICLE INSPECTION (FAI)

First Article Inspection (FAI) shall be performed in accordance with the requirements of AS9102 ("Aerospace First Article Inspection Requirement") as per the revision level established at time of purchase order (PO) issuance. FAI shall be performed **prior** to product acceptance and/or shipment to Northrop Grumman. Where product does not meet the intent of "first production run", as defined within AS9102, FAI may be deferred until product manufactured meets the intent of "first production run". In such instances, 100% of all product characteristics shall be inspected on the entire quantity of product prior to shipment to NG-SSSD. FAI Reports and supporting documents shall be retained at the supplier and provided at no cost to NG when requested by the Buyer.

The following fields indicated on the AS9102 FAI Report Form 1 are mandatory for NGSSSD: 11, 12, 21, 22, 23, and 24. All Conditionally Required fields on FAI Report Forms 2 and 3 shall be completed. In addition, any FAI report form generated shall not contain open fields. To ensure each field of the FAI has been reviewed, the supplier shall mark all open or unused fields "N/A."

If the supplier already has FAI documentation on file for the same configuration of product noted in the PO and is still compliant with AS9102, Paragraph 5.3 requirements, a new FAI is not required.

The FAI Report will remain open (Not Complete) if Qualification Testing is required per engineering and not accomplished at time of FAI part verification.

Suppliers may obtain copies of the AS9102 Forms and Frequently Asked Questions information from <http://www.sae.org/aagg/publications/as9102a-faq.htm>.

Commercial Off the Shelf (Standard/Catalog Hardware items) are not subject to FAI. For Custom/Modified Off the Shelf assemblies and sub-assemblies, only the modification is subject to FAI.

Q034A CONTROL OF SOFTWARE

Seller shall provide and maintain a system for the control of software used in the qualification/acceptance testing of deliverable hardware, software and firmware to be furnished on this procurement. Seller shall maintain procedures and test records on items delivered to Buyer and these records shall be available for Buyer's review.

Q034B CONTROL OF SOFTWARE

Seller shall deliver documentation of software as specified in the procurement document. Software documentation shall be sufficient to establish that:

- All requirements are achieved or waivers submitted.
- Configuration is correct and deliverables are properly identified and marked.

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- Planned level of acceptance is achieved and/or deviations/waivers are made part of the deliverable documentation package.
- Operating instructions accompanying the developed software are sufficient to enable loading, initialization, and operation by Buyer's personnel.

Q034C CONTROL OF SOFTWARE

Seller shall provide and maintain a software development program, which is in conformance with MIL-STD-498, "Software Development and Documentation."

Q034D CONTROL OF SOFTWARE

Seller shall provide and maintain a software development program in accordance with requirements of MIL-STD-498, "Software Development and Documentation" that have been tailored as specified in Buyer's procurement documents.

Q034E CONTROL OF SOFTWARE

Canceled

Q034F CONTROL OF SOFTWARE

Canceled

Q034G CONTROL OF SOFTWARE

Seller shall provide and maintain a software development process that is in compliance with 12207-2008, "ISO / IEC / IEEE Standards for Systems and Software Engineering – Software Life Cycle Processes."

Q034H CONTROL OF SOFTWARE

Seller shall provide and maintain a software development process that is in compliant with 12207-2008, "ISO / IEC / IEEE Standards for Systems and Software Engineering – Software Life Cycle Processes" that have been tailored as specified in Buyer's procurement documents.

Q034I CONTROL OF SOFTWARE

Seller shall provide and maintain a software development program that is in compliance with CMU/SEI-93-TR-024 – "Capability Maturity Model for Software, Version 1.1"

Seller shall provide and maintain a software development program that is in compliant with CMU/SEI-93-TR-024- "Capability Maturity Model for Software, Version 1.1" that has been tailored as specified in Buyer's procurement documents

Q035 ELECTROSTATIC DISCHARGE CONTROL

Seller shall provide and maintain a program for electrostatic discharge (ESD) control for hardware items to be furnished on this procurement. Buyer's requirements are as specified in the procurement document. Seller electrostatic discharge control program is subject to review and approval by the Buyer.

Q041 LEAD MATERIAL REQUIREMENTS

This procurement requires hot solder coating of electrical component leads. Solder coating shall be performed in accordance with MIL-PRF-38535 for microcircuits, MIL-PRF-38534 or MIL-PRF-55310 for hybrids, or MIL-PRF-19500 for semiconductor devices. Seller shall submit a Certificate of Conformance with the shipment attesting that hot solder coating was performed.

Q044 PROHIBITED MATERIAL (Pure Cadmium, Pure Zinc, Pure Tin)

Cancelled. This quality clause has been replaced with Q044A, Q044B, and Q044C. When Q-clause Q44 is included in the purchase order, the requirements of Q44A are applicable.

Q044A PROHIBITED MATERIAL (Pure Cadmium, Pure Zinc, Pure Tin)

All constructions and finishes containing pure cadmium or pure zinc are prohibited. In addition, constructions and finishes containing pure tin are prohibited unless they contain a minimum of 3 weight percent lead. The use of lead-free solder alloys is not acceptable unless approved by the Buyer. (Note: Sn96/Ag4, Sn95/Sb5, and Au80/Sn20 are acceptable when indicated in Buyer specifications, or Buyer approved Process Identification Documents [PID].) The requirement of this Q-Clause shall be flowed down to any sub-tiers utilized in fulfilling the requirements of this purchase order.

If the final deliverable item contains metallic components which are encapsulated and cannot be tested for Prohibited Material in the final deliverable configuration of the item (e.g. motor/resolver (i.e., 2BXXX), harmonic drive (i.e., 5ZXXX), or heat pipe assembly (i.e., CXXXXXX)), the Seller shall ensure Buyer approved Elemental Composition Testing (i.e., XRF or EDS), capable of providing quantitative accuracy sufficient to preclude prohibited material, is performed on the individual metallic components prior to assembly. The elemental composition test results shall be included with the final deliverable item for shipment to the Buyer. NOTE: The requirement for test result is not applicable when the supplier is providing discreet Destructive Physical Analysis (DPA) or Prohibited Material samples as indicated on the purchase order.

Q044B PROHIBITED MATERIAL (Pure Cadmium, Pure Zinc, Pure Tin – No Testing)

All constructions and finishes containing pure cadmium or pure zinc are prohibited. In addition, constructions and finishes containing pure tin are prohibited unless they contain a minimum of 3 weight percent lead. The use of lead-free solder alloys is not acceptable unless approved by the Buyer. (Note: Sn96/Ag4, Sn95/Sb5, and Au80/Sn20 are acceptable when indicated in Buyer specifications, or Buyer approved Process Identification Documents [PID].) The requirement of this Q-Clause shall be flowed down to any sub-tiers utilized in fulfilling the requirements of this purchase order.

Q044C PROHIBITED MATERIAL (Tin Only – No Testing)

All constructions and finishes containing pure tin are prohibited unless they contain a minimum of 3 weight percent lead. The use of lead-free solder alloys is not acceptable unless approved by the Buyer. (Note: Sn96/Ag4, Sn95/Sb5, and Au80/Sn20 are acceptable when indicated in Buyer specifications, or Buyer approved Process Identification Documents [PID].) The requirement of this Q-Clause shall be flowed down to any sub-tiers utilized in fulfilling the requirements of this purchase order.

Q045 SEMICONDUCTOR CERTIFICATION

Shipment of electronic devices using semiconductors shall be accompanied by a certification of conformance from Seller, stating as a minimum:

- The name and location of the original manufacturer of any semiconductor used in the fabrication of the end item.
- The semiconductor lot number.

Q048 QUALITY SYSTEM: AS9003

The Seller shall provide and maintain a Quality Management System (QMS) that demonstrates its ability to consistently provide product that meets customer's requirements including certification or compliance to the AS9003 QMS Standard. QMS systems certified or compliant with AS9120, ISO9001, or AS9100 shall also be acceptable.

Q049 QUALITY SYSTEM: ISO9001

The Seller shall provide and maintain a Quality Management System (QMS) that demonstrates its ability to consistently provide product that meets customer's requirements including certification or compliance to the ISO9001 QMS Standard. QMS systems certified or compliant AS9100 and AS9120 shall also be acceptable.

Q050 QUALITY SYSTEM: AS9100

The Seller shall provide and maintain a Quality Management System (QMS) that demonstrates its ability to consistently provide product that meets customer's requirements including certification or compliance to the AS9100 QMS Standard.

Q051 CONTAMINATION/FOREIGN OBJECT DEBRIS (FOD) CONTROL

Seller shall maintain an FOD prevention program. Seller's FOD prevention program shall include the review of design and manufacturing processes to identify and eliminate foreign object entrapment areas and paths through which foreign objects can migrate. Articles ordered under this procurement document shall be protected by Seller from contamination or damage from foreign objects during processing, testing, inspection, handling, and packaging prior to delivery to Seller. Buyer shall have the right to perform inspections, verifications, and FOD prevention program audits at Seller's facility to ensure program documentation and effectiveness.

Q052 CRITICAL ITEM CONTROL

Special Attention Item and/or Critical Item Control requirements are contained with the applicable engineering documentation. Inspection, witnessing, and/or verification by NG personnel is required. The Seller will perform independent evaluation and ensure implementation and adherence to the applicable requirements.

NOTE: Items changed with this revision:

Q-clause designations revised to align with SAP system, removing hyphens (-) throughout Q-clause numbers and replacing with leading zeroes, e.g. Q-1 replaced with Q001, Q-52 replaced with Q052, etc.

Q44 cancelled and replaced with Q044A, Q044B, and Q044C.

Approved by: _____