**Information Systems**

**Q Clauses**

**Supplier Quality Requirements**

**Prepared by:**

Northrop Grumman Systems Corporation

Information Systems Sector

Supplier Mission Assurance

7575 Colshire Drive

McLean, Virginia 22102

**Revision/Change Record**

**Guidance:** This page captures changes to this document.

| **Revision** | **Date** | **Revision/Change Description** | **Pages Affected** |
| --- | --- | --- | --- |
| 01 | 10/01/10 | Updated address & authors title | Cover |
| 02 | 02/01/11 | Updated MSQ-9  Updated to reflect AS9100C  Updated MSQ-23  Updated MSQ -34  Removed Appendix A: Traceability Matrix  Updated IS09001:2000 to ISO9001:2008  Added MSQ-36  Added MSQ-37 | 16  17  23  26  Appendix A  All  28  32 |
| 03 | 10/01/12 | Changed name of document from Procurement to Supplier Quality requirements  Added applicability table  Added additional requirement for storage, handling and First Article  Added requirement for Certificate of Traceability for raw material and distributers  Updated ISO9000 reference | Cover  5  23  All  All |
| 04 | 08/01/13 | Updated to include clauses 38 through 46 (see table of contents for description)  Applicability table updated | 37 – *5*9  5 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Table of Contents**

**Guidance:** This section captures the content of this document. To update the Table of Contents, select from “1.0 Purpose” through the end of the Table of Contents, then select F9.

[1.0 Purpose 5](#_Toc357509001)

[2.0 Definitions 5](#_Toc357509002)

[3.0 Supplier Quality Requirements 6](#_Toc357509003)

[MSQ-1 General Quality Assurance Requirements 6](#_Toc357509004)

[MSQ-2 Buyer Inspection/Surveillance 12](#_Toc357509005)

[MSQ-3 U.S. Government Source Inspection (NASA) 14](#_Toc357509006)

[MSQ-4 U.S. Government Source Inspection (DoD) 14](#_Toc357509007)

[MSQ-5 Raw Material Documentation Requirements 15](#_Toc357509008)

[MSQ-6 Control of Special Processes 15](#_Toc357509009)

[MSQ-7 Inspection / Test Data 16](#_Toc357509010)

[MSQ-8 Radiographic / Computer Tomography Inspection 16](#_Toc357509011)

[MSQ-9 Requirements for Distributors 17](#_Toc357509012)

[MSQ-10 Seller Inspection Reporting Requirements 18](#_Toc357509013)

[MSQ-11 Calibration System Requirements 18](#_Toc357509014)

[MSQ-12 Control of Software 19](#_Toc357509015)

[MSQ-13 Electrostatic Discharge Control 20](#_Toc357509016)

[MSQ-14 NASA Quality Program Provisions 20](#_Toc357509017)

[MSQ-15 NASA Inspection System Provisions 21](#_Toc357509018)

[MSQ-16 NASA Safety, Reliability, Maintainability and Quality Provisions 21](#_Toc357509019)

[MSQ-17 Prohibited Material (Electrical, Electronic & Electromechanical Parts) 21](#_Toc357509020)

[MSQ-18 Semiconductor Certification 22](#_Toc357509021)

[MSQ-19 Quality Management System 22](#_Toc357509022)

[MSQ-20 First Article Inspection 24](#_Toc357509023)

[MSQ-21 Inspection data for Critical to Function (CTF) Drawings 25](#_Toc357509024)

[MSQ-22 Contamination / Foreign Object Debris (FOD) Control 25](#_Toc357509025)

[MSQ-23 Unique Identification (UID) (DFARS 252.211-7003) 26](#_Toc357509026)

[MSQ-24 Solder Workmanship Standard 26](#_Toc357509027)

[MSQ-25 Solderability 26](#_Toc357509028)

[MSQ-26 Material Outgoing to Seller (Customer Furnished Property) 27](#_Toc357509029)

[MSQ-27 Cable Workmanship Standard 27](#_Toc357509030)

[MSQ-28 Printed Wiring Board 28](#_Toc357509031)

[MSQ-29 Test Coupon 28](#_Toc357509032)

[MSQ-30 Printed Wiring Board Testing 28](#_Toc357509033)

[MSQ-31 Supplier Information Request (SIR) 28](#_Toc357509034)

[MSQ-32 Variation Management AS9103 28](#_Toc357509035)

[MSQ-33 Drop Ship 29](#_Toc357509036)

[MSQ-34 Seller’s Basic Certificate of Conformance 29](#_Toc357509037)

[MSQ-35 End Item Data Package (EIDP) 30](#_Toc357509038)

[MSQ-36 Material Authenticity/Counterfeit Parts 31](#_Toc357509039)

[MSQ-37 Material Authenticity/Counterfeit Parts 35](#_Toc357509040)

[MSQ-38 Material Authenticity/Counterfeit Part Prevention Requirements for Electronic Component Suppliers and Distributors 38](#_Toc357509041)

[MSQ-39 Material Authenticity/Counterfeit Parts Requirements for Suppliers and Subcontractors of Electronic Assemblies, Subsystems and Systems 42](#_Toc357509042)

[MSQ-40 Material Authenticity/Counterfeit Part Prevention Requirements for Non-Electronic Material Suppliers and Distributors 44](#_Toc357509043)

[MSQ-41 Authenticity Validation Requirements for Electronic Components/Parts 51](#_Toc357509044)

[MSQ-42 Information Technology (IT) Services Management for suppliers providing IT services 55](#_Toc357509045)

[MSQ-43 Calibration Services Requirements for Supplier Providing Calibration 56](#_Toc357509046)

[MSQ-44 Maintenance Services Requirements 57](#_Toc357509047)

[MSQ-45 Service Requirements 57](#_Toc357509048)

[MSQ-46 Staff Augmentation 58](#_Toc357509049)

[4.0 Acronyms 58](#_Toc357509050)

1.0 Purpose

This document establishes the minimum quality requirements (Q Clauses), which Mission Assurance should apply to the requisition before approval and submittal to Supply Chain for incorporation into the Procurement/Subcontract document. The requirements for each program and/or customer are unique, but the table below provides recommended guidance on the clauses to flow down per procured item. Programs with a Department of Defense or NASA customer should consider the clauses specified in the final two columns as well as those included in the MSQ clauses column.

|  |  |  |  |
| --- | --- | --- | --- |
| **Procured Item** | **MSQ Clauses** | **DoD Programs** | **NASA Programs** |
| Raw Material | 1,5,7,11,19 |  |  |
| Mechanical / Structural Parts | 1,2,6,7,11,19,40 | 4 | 3,14,15,16 |
| Electronic Parts | 1,2,6,7,11,13,17,18,19,24,38 | 4 | 3,14,15,16,17 |
| Mechanical Assemblies and higher-order levels of integration | 1,2,6,7,11,19,20,22,34,35,40 | 4 | 3,14,15,16 |
| Electrical/Electronic Assemblies and higher-order levels of integration | 1,2,6,7,11,13,17,19,20,22,24,34,35,  39 | 4 | 3,14,15,16 |
| COTS Electronic Products procured from OCM/OEM | 1,19,34 |  |  |
| COTS Electronic Products procured from Distributer | 1,9,19,34,40 |  |  |
| Software developed under PO/Subcontract | 1,7,11,12,19,34,35 |  | 14,15,16 |
| IT Services | 1,19,42 |  | 14,15,16 |
| Services | 1,19,46 |  | 14,15,16 |

2.0 Definitions

A. Buyer: Northrop Grumman Procurement entity.

B. Seller (AKA Supplier, Subcontractor): The legal entity that is the contracting party with the Buyer with respect to the procurement document.

C. Procurement Document: The Purchase Order or subcontract between the parties.

D. Item: The product or service contracted for by the procurement document.

E. Rework: Previously documented and approved process that brings the product into conformance with defined requirements.

F. Repair: A condition where the product cannot conform to engineering standards; however, a subsequent operation can be performed to return the product to a condition that **shall** meet fit, form, and function.

3.0 Supplier Quality Requirements

The following Quality (Q) Clauses are a requirement of the procurement document when explicitly specified by a clause number. Unless specifically indentified, the revision of the applicable documents and standards referenced herein **shall** be the latest version that is in effect as of the date of the release of the Procurement/Subcontract document.

MSQ-1 General Quality Assurance Requirements

**Guidance:** A, B, C, D, E, F, G, H, I, J, K, L, M, N, O and P all apply when MSQ-1 is required. Exclusions should be noted on the Purchase Order / Subcontract.

A. PROHIBITED PRACTICES

1. Unauthorized Repairs: Seller **shall** not repair any damaged item, or any item found to be faulty during manufacturing or that fails to meet Buyer specification/drawing requirements, without Buyer’s written approval, except when the nonconformance is minor and Material Review Board (MRB) authorization has been granted by Northrop Grumman. Seller is not authorized to perform MRB activities on non-conforming materials without Buyer authorization.

2. Change in Approval, Drawing, Processes, Materials, or Procedures: Seller **shall** not change any drawing, process, material (including sub-tier supplier parts), or procedure without prior Buyer’s written approval, if such drawing, process, material, or procedure was used to qualify items or which was used by Seller to become a qualified source.

3. Seller **shall** notify Buyer in writing of any proposed change in design, fabrication method, or process prior to delivery of the item to the Buyer.

a. Articles, which have incorporated approved changes, **shall** be appropriately identified.

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

5. Notification of Facility Change: Seller **shall** not use any production, manufacturing, and/or processing facilities that differ from facilities previously approved by Buyer without first notifying Buyer and affording Buyer an opportunity to examine and approve such facilities for compliance with procurement quality requirements. Seller **shall** not relocate any production, manufacturing, and/or processing facilities previously approved by Buyer without first notifying Buyer and affording Buyer an opportunity to examine and approve such facilities for compliance with supplier quality requirements.

6. Changing of Test Facility: Seller **shall** not change a test facility or use another test facility to meet specification/drawing requirements without prior Buyer’s written approval, if a specific test facility was previously approved by Buyer as provided for in the procurement document.

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

B. RESPONSIBILITY FOR CONFORMANCE

1. Neither surveillance, inspection, and/or test made by Buyer or its representatives or U.S. Government representatives at either Seller’s or Buyer’s facility, or Seller’s compliance with all applicable supplier quality requirements, **shall** relieve Seller of the responsibility to furnish an item that conforms to the requirements of the procurement document.

2. Seller **shall** control sub-tier supplier procurements to the extent necessary to ensure quality requirements specified in the procurement document are satisfied.

3. Quality requirements **shall** include, but are not limited to, the following:

a. Sub-tier supplier pre-award survey/evaluations

b. Periodic auditing of supplier

c. Implementing a sub-tier supplier rating system

d. Ensuring adequate review of procurement documentation prior to procurements

e. Controlling procurement of items for Seller’s product

f. Inspection of procured items to documented procedures

g. Control of non-conforming material, including corrective action

C. BUYER SURVEY, SURVEILLANCE, AUDITS AND INSPECTION

1. Buyer **shall** have the right to conduct surveys, audits, and surveillance of Seller facilities, and those of Seller’s sub-tier suppliers with prior coordination with Seller, to determine capability to comply, and to verify continuing compliance, with the requirements of the procurement document.

2. Buyer **shall** have the right to perform an inspection at Seller’s facilities and those of Seller’s sub-tier supplier with prior coordination with Seller, during the period of manufacturing and inspection prior to shipment.

3. Final inspection and acceptance **shall** be performed at Buyer’s facility, unless otherwise specified in the procurement document.

D. RESERVED

E. CORRECTIVE ACTION REQUEST

1. When a quality problem exists with Seller’s items, Buyer **may** require Seller to complete a Corrective Action Request.

2. Responses to Corrective Action Requests **shall** be timely and **shall** include the following information:

a. Root cause of the deficiency

b. Action taken to correct the specific deficiency

c. Action taken to prevent recurrence of the deficiency

d. Action taken to determine if other products are affected

e. Effectivity date for implementation of identified corrective and preventive actions

f. Verification that the corrective and preventive actions are effective

F. U.S. GOVERNMENT SOURCE INSPECTION

For procurements made under U.S. Government contracts, the U.S. Government **shall** have the right to inspect any and all of the work included in the procurement document, at Seller’s facilities or at sub-tier supplier’s 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

1. 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 in the procurement document.

2. Documented schedules **shall** be maintained for periodic calibration to adequate standards.

3. Objective evidence of calibrations **shall** be recorded and made available for Buyer’s review.

H. NONCONFORMING MATERIALS

1. Seller **shall** provide and maintain a corrective action and disposition program for non-conforming materials.

2. Seller **shall** provide for control, segregation, and identification of non-conforming materials detected at Seller’s facilities.

3. Seller **shall** not have MRB disposition authority without Buyer’s written authorization.

4. No repair **shall** be allowed outside of the specific specification limits unless prior written approval is obtained by Seller from Buyer.

5. RESERVED

I. INSPECTION RECORDS

1. Seller **shall** maintain records of all inspections and tests performed on any item delivered to Buyer.

2. Records **shall** identify any non-conformance and **shall** be made available for Buyer’s review.

3. Seller **shall** ensure records are available for review by Customers and Regulatory Authorities in accordance with contract or regulatory requirements.

J. SAMPLE INSPECTION

1. Seller, prior to implementation of a sampling plan, **shall** provide a copy of said plan to the Buyer. Buyer reserves the right to reject any plan which does not conform to the quality requirements of the program.

2. 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.

3. Sample inspection **shall** be in accordance with the applicable Buyer specification. When not specified by Buyer, military standard sampling plans, e.g., from ANSI/ASQCZ1.4-11, MIL-STD-414, or handbooks H016, H017, and H018, **may** be used.

4. All sample inspection plans **shall** provide valid confidence in specified quality levels.

K. IDENTIFICATION

1. All materials **shall** be identified by a part number and revision, permanently and legibly affixed directly to the surface of each article,

2. In the event this is not possible due to physical size or nature of material, an identification tag **shall** be securely affixed to each article, or

3. If articles are supplied in individual or multi-unit containers the container **shall** reveal the appropriate identification.

L. PACKAGING, PRESERVATION, AND STORAGE

1. Seller **shall** incorporate good commercial practices for preservation and packaging of all articles that apply to this Purchase Order / Subcontract, unless otherwise stated within the Purchase Order / Subcontract or attached documentation.

2. Seller **shall** identify each package permanently and legibly with Purchase Order / Subcontract number, manufacturer’s name, date shipped, and packing sheet number.

3. Packaging **shall** be selected, to the extent necessary, to provide protection from physical and environmental damage during shipping and handling.

a. Cushioning materials **shall** be applied, as required, to protect and to restrict movement of items.

4. All materials which are volatile, toxic, or emit fumes, which are harmful to human health, **shall** be properly contained in accordance with applicable health and safety requirements. Seller **shall** take appropriate measures to prevent handling damage, from preparation for shipment through receipt (i.e., palletizing, shrink wrapping, or otherwise securing materials for shipment to prevent degradation during transit).

a. Containers **shall** be plainly marked as to its contents with appropriate warnings, precautions, instructions, and storage conditions.

b. Material Safety Data Sheet (MSDS) **shall** be included with each shipment.

M. STORAGE AND SHELF LIFE

1. Seller **shall** identify materials and articles having definite characteristics of quality degradation or drift with age and/or the environment. Where shelf life is either a specified requirement or is needed to ensure end-of-life performance, the seller **shall** affix appropriate label identifying the shelf life expiration date to supplied materials.

2. Identification **shall** indicate the date and/or cycle that the critical life was initiated and the date and/or cycle at which the useful life will be expended.

3. If environment is a factor in determining useful life, identification **shall** also include the storage temperature, humidity, etc., required to achieve the stated useful life.

4. In no case **shall** materials or articles be supplied to Buyer with less than 75% of its useful life or cycles remaining; however, Seller **shall** verify that sufficient operating life and environmental margin remains to meet the specified requirements of the procurement document.

N. RESERVED

O. CERTIFICATE OF GOVERNMENT APPROVED QUALIFIED PARTS LIST (QPL) ITEMS

When the items supplied are required to be Qualified Parts List (QPL)/Qualified Manufacturers Line (QML) parts the following **shall** apply:

1. Seller **shall** submit a certification identifying that the manufacturer of the material described herein has been granted qualification by the Defense Supply Agency (DSA) in accordance with the applicable military specification.

2. The inclusion of products from the QPL **shall** not relieve the manufacturer of their responsibility for providing items, which meet all specification requirements, or for performing the qualification, inspections, and tests specified for such items.

P. CONTROL OF PROCESSES

1. Seller **shall** monitor processes to ensure supplier services and/or products meet contractual requirements

2. Seller **shall** take corrective action when process measures indicate that products or services could potentially falls outside of acceptable, contractual limits.

MSQ-2 Buyer Inspection/Surveillance

**Guidance:** Select each section that is required A, B, C, D, E, F, or G.

A. SOURCE INSPECTION

1. Buyer **shall** be present to perform source inspection at Seller’s facilities or where designated in the Purchase Order / Subcontract prior to shipment.

2. Inspection and test of the articles defined in this contract **shall** be performed by Seller, and **shall** be subject to witnessing by Buyer.

3. Seller **shall** provide reasonable inspection facilities for Buyer to verify conformance to requirements.

4. Seller **shall** provide inspection/test data and reports to Buyer’s Source Inspector indicating which characteristics, parameters, dimensions, etc., were actually tested/inspected for validation to Buyer’s specification/drawing requirements.

5. After Buyer’s Source Inspection, any rework or test of the item, including any nonscheduled entry, such as removal of a panel, cover, or enclosure **shall** void the source inspection.

6. For any nonscheduled entry, rework, or test, Seller **shall** request Buyer to repeat source inspection.

7. Buyer’s purchasing department **shall** be notified at a minimum of seven (7) workdays prior to commencement of these activities to allow for arrangements for Buyer’s quality representative to be present during inspection and test.

B. BUYER IN-PROCESS INSPECTION

1. Buyer **shall** perform in-process inspection at Seller’s facilities.

2. Seller **shall** submit to Buyer an inspection plan or traveler designating in-process source inspection points.

3. Buyer **shall** designate required in-process source inspection points and inform Seller in writing.

4. Seller **shall** provide reasonable inspection facilities for Buyer to verify conformance to requirements.

5. After Buyer’s Source Inspection, any rework or test of the item, including any nonscheduled entry, such as removal of a panel, cover, or enclosure **shall** void the source inspection.

6. For any nonscheduled entry, rework, or test, Seller **shall** request Buyer to repeat source inspection.

7. Seller **shall** notify Buyer at a minimum of 48 hours prior to the time in-process inspection coverage is required.

C. BUYER PRECAP INSPECTION

Items in the procurement document **shall** require pre-cap inspection by Buyer’s Quality Field Engineering subsequent to the 100 percent pre-cap visual inspection performed by Seller.

D. BUYER SCANNING ELECTRON MICROSCOPE ANALYSIS

1. Buyer’s approval of Scanning Electron Microscope (SEM) analysis **shall** be required for wafer lots to be incorporated in parts supplied to Buyer’s Quality Field Engineering.

2. SEM analysis **shall** be performed by Seller and **shall** be approved by Buyer prior to the incorporation of wafers in parts.

E. BUYER SOURCE SURVEILLANCE

1. Buyer’s Quality Field Engineering **shall** perform surveillance at Seller’s facilities during the contract period.

2. Surveillance **shall** be scheduled by Buyer, and coordinated with Seller prior to implementation.

3. Surveillance activities **shall** include all functional areas necessary for Buyer to verify the quality of the procured product.

F. BUYER SOFTWARE AUDITS

Buyer **shall** perform audits, reviews, and/or verifications at Seller’s facilities during the development and test of software to be furnished for this procurement.

G. Electronic Source Inspection

1. Seller **shall** provide electronic source inspection.

2. Electronic source inspection **shall** consist of photos sent to Buyer via electronic media. Test data **shall** also be sent electronically when MSQ-7 is required on the Purchase Order / Subcontract.

3. Buyer **shall** review and provide authorization to ship predicated on the results of the photos and test data when test data is required with MSQ-7 on the Purchase Order / Subcontract.

MSQ-3 U.S. Government Source Inspection (NASA)

**Guidance:** A, B, C, D and E all apply when MSQ-3 is required.

A. All work under the procurement document **shall** be subject to inspection and test by the U.S. Government at any time and place.

B. The U.S. Government representative, who has been delegated NASA quality assurance functions for the procurement document, **shall** be notified immediately upon receipt thereof.

C. The U.S. Government representative **shall** be notified three working days in advance of the time the items are ready for inspection or test.

D. In the event the U.S. Government representative cannot be contacted, Buyer **shall** be notified immediately.

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

MSQ-4 U.S. Government Source Inspection (DoD)

**Guidance:** A, B, C, D and E all apply when MSQ-4 is required.

A. U.S. Government source inspection **shall** be required prior to shipment from Seller’s facility.

B. 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 Seller’s facility, so appropriate planning for U.S. Government source inspection can be accomplished.

C. If a U.S. Government representative does not normally service Seller’s facility, the nearest Army, Navy, Air Force, or Defense Agency inspection Office **shall** be contacted.

D. In the event a U.S. Government representative cannot be contacted, Buyer **shall** be notified immediately.

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

MSQ-5 Raw Material Documentation Requirements

**Guidance:** Select each section that is required A, B or C.

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

1. Material identification by specification number and material conditions, where applicable.

2. The raw material manufacturer’s or mill’s lot or batch number.

3. A statement of raw material conformance to applicable requirements.

4. The name and location of the raw material manufacturer or mill.

B. All items defined in MSQ5-A with the addition of actual chemical/physical test results that substantiate compliance with the applicable raw material and/or specification requirements **shall** be provided.

C. Seller **shall** provide a Certificate of Traceability showing unbroken Chain of Custody from the lowest level component to configured end item(s).

MSQ-6 Control of Special Processes

**Guidance:** A, B and C apply when MSQ-6 is required.

A. Buyer **shall** approve special processes performed by Seller, or any of its sub-tier suppliers, including the system/procedures used to control special processes. Processes requiring Buyer approval include:

1. Welding, destructive physical analysis, brazing, dye penetrate inspection, painting, radiographic inspection, plating, heat treating of metals, casting, chemical surface treatments, forging, contamination control, bonding, magnetic particle inspections, conformal coat, composites, soldering, pressure test, and ultrasonic inspection

2. Any other processes defined in the Purchase Order / Subcontract

B. Buyer approval of special processes **shall** not relieve Seller of responsibility for exercising the control measures necessary to ensure delivered items conform to the requirements of the Purchase Order / Subcontract.

C. Sub-contract and Contract manufacturer’s **shall** have the responsibility of approving, auditing and maintaining their sub-tier suppliers for special processes. Northrop Grumman reserves the right to review any records pertaining to special processes and will be made available for review upon request.

MSQ-7 Inspection / Test Data

**Guidance:** A and B apply when MSQ-7 is required.

A. When Buyer’s specifications or procurement document require test data to be recorded during the performance of acceptance testing, a paper or preferably electronic copy of the recorded data, showing evidence of Seller’s inspection and verification of performance, **shall** accompany each shipment.

B. Data **shall** meet the requirements of Buyer’s specifications or procurement document and, at a minimum, be identified with:

1. Buyer’s Purchase Order / Subcontract number and change notice number

2. Part number

3. Lot numbers, serial numbers, or date codes of items tested

4. Drawing/specification and revision used

5. Type of test performed

6. Identification number of test equipment used

7. Total quantity of items tested, quantity of items accepted, and quantity of items rejected

8. Any codes, keys, or other information necessary to interpret Seller data

MSQ-8 Radiographic / Computer Tomography Inspection

**Guidance:** A, B, C, D, and E apply when MSQ-8 is required. Exclusion of B or C is acceptable based on inspection method.

A. Seller **shall** be approved by Buyer to perform the radiographic/computer tomography inspection applicable to this procurement document or **shall** use a facility approved by Buyer.

B. Unless otherwise specified by the parts specification, each radiograph **shall** comply with ASTM E 1742 “Radiographic Examination”, MIL-STD-883 “Test Method and Procedures for Microelectronics”, and MIL-STD-750 “Test Method for Semiconductor Devices”.

C. Unless otherwise specified by the parts specification, computer tomography **shall** comply with ASTM-E1441 “Standard Guide for Computer Tomography Imaging”.

D. The radiographic film / image and a copy of the report **shall** accompany the shipment of the items to Buyer.

E. Serial number location and x-ray position **shall** be recorded as part of, or attached to, the report.

MSQ-9 Requirements for Distributors

**Guidance:** A, B and C apply when MSQ-9 is required unless only 1 subclause is specified.

A. The Distributor (a Seller other than the Manufacturer) **shall** certify that the articles delivered under this Purchase Order / Subcontract conform to the applicable requirements of Buyer’s or Manufacturer’s specifications for the article ordered.

B. The Distributor Certification of Conformance **shall** include the following information:

1. The origin of manufacture

2. Part number

3. Applicable traceability information (date lot code, etc.)

4. Results of testing or special inspection, as required

5. Dated signature of authorized Seller Representative

6. Items identified by Buyer number **shall** have complete information as to the original manufacturer and original manufacturer's part number

C. The Distributer Certificate of Traceability **shall** provide documented traceability and unbroken Chain of Custody from the OCM/OEM to the Seller.

MSQ-10 Seller Inspection Reporting Requirements

**Guidance:** A, B, C, and D apply when MSQ-10 is required.

A. Seller **shall** submit, with each shipment of items, one copy of an inspection report reflecting 100 percent inspection verification of all drawing characteristics, including notes, for all products.

B. The report **shall** delineate each drawing characteristic and specify the corresponding actual measurement results.

C. Inspection record traceability **shall** be maintained by either serializing each item, if allowed, or tag identification. The item identification is then matched with the corresponding inspection report.

D. The only exception to the above procedure applies to items machined under tape-controlled or automatic conditions. In that case, the 100 percent inspection report **shall** be limited to the first and last item procured from one continuous set-up.

1. The inspection report **shall** state that the items were machined under tape-controlled or automatic conditions.

MSQ-11 Calibration System Requirements

**Guidance:** A and B apply when MSQ-11 is required.

A. Seller **shall** be responsible for the calibration, accuracy, validation, and maintenance of any equipment, tooling, or gauges utilized by Seller to produce, inspect, or test articles to be delivered under this Purchase Order / Subcontract.

B. Seller‘s equipment calibration system **shall** be in accordance with one of the four requirements listed below:

1. MIL-STD-45662A or

2. ANSI/NCSL Z540 or

3. ISO 10012-1

4. ISO 17025

MSQ-12 Control of Software

**Guidance:** Select any combination of A, B, and C that apply. A Software Quality Assurance Program **shall** be selected when using A: MSQ-12A-1a, MSQ-12A-1b, MSQ-12A-1c, or MSQ-12A-1d.

A. SOFTWARE QUALITY PROGRAM

1. Seller **shall** establish a Software Quality Assurance Program that conforms to the standards specified

a. AS9006, Deliverable Aerospace Software Supplement for AS9100,

b. ISO/IEC 12207, Software Life Cycle Processes,

c. Capability Maturity Model Integration (CMMI) - Level 3 or higher, or

d. Federal Aviation Administration DO-178 – Software Considerations in Airborne Systems and Equipment Certification.

B. SOFTWARE DELIVERY DOCUMENTATION

1. Seller **shall** deliver software documentation as specified in the procurement document.

2. Software documentation **shall** be sufficient to ensure:

a. All requirements are achieved or waivers are submitted

b. Configuration is correct and deliverables are properly identified and marked

c. Planned level of acceptance is achieved and/or approved deviation/waivers are made part of the deliverable documentation package

d. Operating instructions accompanying the developed software are sufficient to enable loading, initialization, and operation by Seller’s personnel

C. CONTROL OF SOFTWARE

1. Seller **shall** provide and maintain a system for the control of software used in the fabrication, qualification/acceptance testing of deliverable hardware, software, and firmware to be furnished for this procurement.

2. Seller **shall** maintain procedures and test records for items delivered to Buyer and these records **shall** be available for Buyer review.

MSQ-13 Electrostatic Discharge Control

**Guidance:** A, B, C and D apply when MSQ-13 is required.

A. Seller **shall** provide and maintain a program for Electrostatic Discharge (ESD) control for hardware items to be furnished for this procurement in accordance with one or more of the following standards:

1. MIL-STD-1686 Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (excluding Electrically Initiated Explosive Devices)

2. ANSI-S20.20 Parts, Electrical and Electronic, Assemblies and Equipment, Protection of (excluding Electrically Initiated Explosive Devices), for the Development of an Electrostatic Discharge Control Program

3. EIA 625 Requirements for Handling Electrostatic Discharge Sensitive Devices

4. MSFC-STD-1800 ESD Control for Propellant and Explosive Devices

5. DoD 4185.26m Contractors Safety Manual for Ammunition and Explosives

B. Seller’s ESD control program **shall** be subject to review and approval by Buyer.

C. Items **shall** be packaged with ESD protective material.

1. ESD protective caps **shall** be used on equipment external connectors or contacts that connect to ESD parts and assemblies within the equipment.

2. All packages **shall** be identified with a suitable precautionary label.

3. The label **shall** not be utilized as a sealing device.

D. Any ESD components or assemblies received by Buyer that are not in an ESD protective material **shall** be subject to return to Seller. **NOTE:** ESD requirements are defined as applicable to any active or passive components.

MSQ-14 NASA Quality Program Provisions

**Guidance:** Select A or B.

A. Seller **shall** provide and maintain a quality assurance program in accordance with NASA Quality Publication NHB 5300.4 (1B), “Quality Program Provisions for Aeronautical and Space System Contractors”.

B. Seller **shall** provide and maintain a quality assurance program in accordance with NHB 5300.4 (1B), “Quality Program Provisions for Aeronautical and Space System Contractors”, that have been tailored as specified in Buyer’s procurement document.

MSQ-15 NASA Inspection System Provisions

**Guidance:** Select A or B.

A. Seller **shall** provide and maintain an inspection system in accordance with NASA Publication NHB 5300.4(1C), “Inspection System Provisions for Aeronautical and Space System Material, Parts, Components, and Services”.

B. Seller **shall** provide and maintain an inspection system in accordance with NHB 5300.4(1C), “Inspection System Provisions for Aeronautical and Space System Material, Parts, Components, and Services,” that have been tailored as specified in Buyer’s procurement document.

MSQ-16 NASA Safety, Reliability, Maintainability and Quality Provisions

**Guidance:** Select A or B.

A. Seller **shall** provide and maintain a quality program in accordance with NASA Quality Publication NHB 5300.4(1D-2), “Safety, Reliability, Maintainability, and Quality provisions for the Space Shuttle Program”.

B. Seller **shall** provide and maintain a quality program in accordance with NASA Quality Publication NHB 5300.4(1D- 2), “Safety, Reliability, Maintainability, and Quality Provisions for the Space Shuttle Program”, that have been tailored as specified in Buyer’s procurement document.

MSQ-17 Prohibited Material (Electrical, Electronic & Electromechanical Parts)

**Guidance:** Buyer will specify A and/or B. C always applies when MSQ-17 is required.

A. All constructions and finishes containing pure cadmium or pure zinc **shall** be prohibited.

B. Constructions and finishes containing pure tin **shall** be prohibited unless they contain a minimum of 3 weight percent alloying element(s), i.e., lead, silver, etc.

C. Seller **shall** submit a certificate with each shipment stating that no prohibited materials are present in their deliverable product.

MSQ-18 Semiconductor Certification

A. Shipment of electronic devices using semiconductors **shall** be accompanied by a certification of conformance from Seller, stating at a minimum:

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

2. The semiconductor lot number.

MSQ-19 Quality Management System

**Guidance:** Select the appropriate Quality Management System requirement.

A. ISO 9001 Compliant

1. Seller **shall** provide and maintain a Quality System that is compliant to ISO 9001.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having a successful audit performed by Buyer.

B. ISO 9001 Registered

1. Seller **shall** provide and maintain a Quality System that is registered to ISO 9001.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having an ISO Certification from an accredited registrar.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s Quality System.

C. AS9100 Compliant

1. Seller **shall** provide and maintain a Quality System that is compliant to AS9100.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having a successful audit performed by Buyer.

D. AS9100 Registered

1. Seller **shall** provide and maintain a Quality System that is registered to AS9100.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having an AS9100 Certification from an accredited registrar.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s Quality System.

E. Capability Maturity Model Integration (CMMI) - Level 3

1. Seller **shall** provide and maintain a Quality System that meets the requirements of CMMI Level 3.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having Software Engineering Institute (SEI) CMMI 3 rating from an accredited appraiser.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s Quality System.

F. Capability Maturity Model Integration (CMMI) - Level 4

1. Seller **shall** provide and maintain a Quality System that meets the requirements of CMMI Level 4.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having Software Engineering Institute (SEI) CMMI 4 rating from an accredited appraiser.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s Quality System.

G. Capability Maturity Model Integration (CMMI) - Level 5

1. Seller **shall** provide and maintain a Quality System that meets the requirements of CMMI Level 5.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having Software Engineering Institute (SEI) CMMI 5 rating from an accredited appraiser.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s Quality System.

H. Capability Maturity Model Integration (CMMI) for Services - Level 3

1. Seller **shall** provide and maintain a Quality System that meets the requirements of CMMI for Services Level 3.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having Software Engineering Institute (SEI) CMMI for Services 3 rating from an accredited appraiser.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s Quality System.

I. Capability Maturity Model Integration (CMMI) for Services - Level 4

1. Seller **shall** provide and maintain a Quality System that meets the requirements of CMMI for Services Level 4.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having Software Engineering Institute (SEI) CMMI for Services 4 rating from an accredited appraiser.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s Quality System.

J. Capability Maturity Model Integration (CMMI) for Services - Level 5

1. Seller **shall** provide and maintain a Quality System that meets the requirements of CMMI for Services Level 5.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having Software Engineering Institute (SEI) CMMI for Services 5 rating from an accredited appraiser.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s Quality System.

K. Quality Management System

1. Seller **shall** have a formalized Quality System.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by a successful Buyer’s Supplier Assessment Audit of the seller’s Quality System.

MSQ-20 First Article Inspection

**Guidance:** All apply when MSQ-20 is required.

A. Inspection and acceptance by Buyer of the first article manufactured against this Purchase Order / Subcontract **shall** be required prior to the start of fabrication.

B. Seller **shall** submit a First Article Report to Buyer demonstrating compliance with the requirements in the Purchase Order / Subcontract and referenced documents (refer to AS9102 and ASME Y14.41 for guidance).

1. The report **shall** reflect 100 percent inspection verification of all drawing characteristics.

2. The report **shall** delineate each drawing characteristic and specify the corresponding actual measurement results.

3. The report **shall** provide evidence of acceptance by the Seller’s authorized Quality Assurance representative.

C. Seller **shall** afford the Buyer the opportunity to witness the performance of First Article Inspection/Testing. See MSQ-2A.7 regarding notification requirements.

D. The FAI requirement, once invoked, **shall** continue to apply even after initial compliance. Any or all of the following events requires re-accomplishment of a full, or a delta/partial FAI for affected characteristics:

1. A change in the design affecting form, fit, or function of the part.

2. A change in manufacturing source(s), processes, assembly line, inspection method(s), location, tooling, or materials.

3. A change in numerical control program or translation to another media.

4. A natural or man-made occurrence which may adversely affect the manufacturing process.

5. All repeat builds on production parts when more than two years has elapsed (or as otherwise directed in the purchase order) since the last production item was produced.

6. When required as part of corrective action for a part number with repetitive rejection history.

MSQ-21 Inspection data for Critical to Function (CTF) Drawings

A. Model Based Product Defined designs and CTF drawings **shall** require recorded data for all defined critical dimensions per ASME Y14.41.

MSQ-22 Contamination / Foreign Object Debris (FOD) Control

**Guidance:** A, B, C and D apply when MSQ-22 is required.

A. Seller **shall** maintain a FOD prevention program.

B. 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.

C. Buyer **shall** have the right to perform inspections, verifications, and FOD prevention program audits at Seller’s facility to ensure program documentation and effectiveness.

D. Articles ordered under this Purchase Order / Subcontract **shall** be protected by Seller from contamination or damage from foreign objects during processing, testing, inspection, handling, and packaging prior to delivery to Seller.

MSQ-23 Unique Identification (UID) (DFARS 252.211-7003)

**Guidance:** A and B always apply when MSQ-23 is required. C and D are required only when they are specified.

A. Defense Federal Acquisition Regulation Supplement (DFARS) clause 252.211-7003, Item Identification and Valuation **shall** be applied to this Purchase Order / Subcontract.

B. UID **shall** be in compliance with MIL-STD-130 (current version at time of Purchase Order / Subcontract receipt).

C. Certification of individual Matrix verification **shall** be supplied by the UID processor to attest that electro-optical scanning and legibility of the UID is consistent with recording standards of UID marking and identification systems.

D. Certification of Registration for individual and/or itemized UID nameplates and identification plates **shall** accompany shipment which affirms accountability and traceability into the U.S. Government web database @ website – http://bpn.gov/iuid/. Latest version at time of PO receipt.

MSQ-24 Solder Workmanship Standard

A. Soldering and processing of electronic assemblies **shall** be in accordance or equivalent with IPC-A-610 “Acceptability of Electronic Assemblies” or J-STD-001 “Requirements for Soldered Electrical and Electronic Assemblies”.

MSQ-25 Solderability

**Guidance:** A, B, and C apply when MSQ-25 is required.

A. Material submitted with each shipment **shall** have had solderability testing performed in accordance with one or more of the following specifications:

1. MIL-STD-750, Method 2026

2. MIL-STD-883, Method 2003

3. MIL-STD-202, Method 208

4. MIL-P-55110

5. MIL-P-50884

6. J-STD-001

7. J-STD-002

8. J-STD-003

B. Seller **shall** supply a copy of the certification by an accredited agency to one or more of the specifications listed in paragraph A with each order.

C. If, during the life of that Purchase Order / Subcontract, the certification is revoked or the certification expires, all efforts against this Purchase Order / Subcontract **shall** be stopped.

1. Buyer **shall** be notified in writing within twenty four hours.

MSQ-26 Material Outgoing to Seller (Customer Furnished Property)

**Guidance:** A, B, C, and D apply when MSQ-26 is required.

A. Materials furnished to Seller, by Buyer, **shall** require accountability by Seller.

B. Materials **shall** be stored and handled in such a manner to ensure the integrity of the material is maintained.

C. Seller **shall** obtain direction from Buyer’s Procurement concerning the disposition of rejected and/or unused quantities, or usable trimming remaining at the end of the procurement activity.

D. Seller **shall** be responsible for maintaining records of identity and the assurance of continued suitability of the tooling, test equipment, etc., while such materials are in their possession.

1. Return of the equipment **shall** be arranged through Buyer’s Procurement.

MSQ-27 Cable Workmanship Standard

A. Workmanship **shall** be in accordance with IPC/WHMA-A-620 “Requirements and Acceptance for Cable and Wire Harness Assemblies”.

MSQ-28 Printed Wiring Board

**Guidance:** A and B apply when MSQ-28 is required.

A. Printed Wiring Boards fabricated under this Purchase Order / Subcontract **shall** comply with the requirements of IPC-A-600 “Acceptability of Printed Boards”, IPC-6011 “Generic Performance of Printed Boards”, and IPC-6012 “Qualification and Performance Specification for Rigid Printed Boards”.

B. Coupons **shall** be included if defined on the drawing with each shipment.

MSQ-29 Test Coupon

A. Test coupons **shall** be provided per the specification for each shipment.

MSQ-30 Printed Wiring Board Testing

**Guidance:** A and B apply when MSQ-30 is required.

A. Unless otherwise specified in Engineering Requirements Documentation, Seller **shall** perform bare board testing with these values: Test voltage -10-250V, continuity -10 ohm maximum, insulation resistance -10K ohm minimum.

1. Acceptable boards **shall** be acceptance stamped.

2. Rejected boards **shall** be identified with the from/to path of failure and annotated either short or open.

3. Seller **shall** not repair.

B. Automated electro-optical inspection **shall** be required with this order if the boards have 4 or more layers.

1. Layer defects **shall** be reported to Buyer for authorization to repair.

MSQ-31 Supplier Information Request ([SIR](https://sharecenter.myngc.com/livelink/livelink.exe/54481791/ISF_P2212.doc?func=doc.Fetch&nodeid=54481791&vernum=3))

A. Seller **shall** utilize the Supplier Information Request (Form 2212) for authorization to ship nonconforming material or to request clarification or change of a drawing / specification requirement. Access to this form **shall** be requested by Seller.

MSQ-32 Variation Management AS9103

A. Seller **shall** implement a Variation Management program in accordance with AS9103, Variation Management of Key Characteristics.

MSQ-33 Drop Ship

**Guidance:** A and B apply when MSQ-33 is required.

A. Seller **shall** deliver parts/material to address identified on the Purchase Order / Subcontract.

B. A copy of all required documentation **shall** be sent to Buyer for receipt and review.

MSQ-34 Seller’s Basic Certificate of Conformance

**Guidance:** A applies when MSQ-34 is required unless subclause B is specified. Clause C appliers if material traceability must be proven.

A. A Certification of Conformance **shall** be provided with each shipment with the following information at a minimum:

1. Purchase Order / Subcontract and Line Item Number

2. Identifying nomenclature as identified by the purchase order (i.e., Item Name, Part Number, Revision, Serial Numbers).

3. Quantity shipped

4. Conformance Clause: “The items furnished per Buyer’s 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.” (or equivalent wording)

5. The Certification of Conformance **shall** be signed by Seller’s duly authorized representative (including electronic signatures)

B. The seller **shall** provide their standard Certificate of Conformance to certify that the articles delivered under this Purchase Order / Subcontract conform to the applicable requirements of Buyer’s or Manufacturer’s specifications for the article ordered.

C. The seller **shall** provide a Certificate of Traceability showing unbroken Chain of Custody from the lowest level component to configured end item(s).

MSQ-35 End Item Data Package (EIDP)

A. An End Item Data Package (EIDP) **shall** be developed, maintained, providedand/or delivered at or before final acceptance of product by the Buyer, which incorporates the following information:

1. Seller Certificate of Conformance (refer to MSQ-34)

2. Specification/drawing number and revision

3. As-built configuration (Indentured Parts List – may not be required for software)

3. Proof of traceability requirements compliance (serial numbers, lot numbers, batch number, software version, etc.)

4. Documented non-conformances

5. Documented open action items

6. Incorporated Change Orders (Engineering Change Proposals (ECPs))

7. Certificate of Conformances from sub-tier suppliers with objective evidence to validate the certificates

8. Type of inspection performed and recorded results

9. Type of test performed and recorded results

10. Total quantity of items tested, quantity of items accepted, and quantity of items rejected

11. Applicable Government Industry Data Exchange Program (GIDEP) alerts, waivers, deviations, and incident reports

12. Verification of compliance with useful life requirements, e.g., total operating time, thermal cycles, vibration time

13. Certificate of Traceability if MSQ-34c is invoked on the Purchase Order / Subcontract

B. Buyer **shall** refuse to accept item if Seller fails to submit certifications, documentation, test data, or reports specified in the procurement document. Documentation **shall** include Buyer’s source inspection if such source inspection is performed.

C. Written approval **shall** be obtained from Buyer for any deviations to the EIDP.

MSQ-36 Material Authenticity/Counterfeit Parts

**Guidance:** Intended for programs that have a contractual requirement to meet the intent of AS5553. **Not to be used on any procurement issued after the date of this revision. Use MSQ-38 or MSQ-39 instead.**

***Instructions for Suppliers***

*The supplier* ***shall*** *be required to apply one of clauses MSQ-36.A, B or C to all electrical, electronic and electro-mechanical hardware procured under contract to Northrop Grumman. The supplier* **shall** *use the clause that most closely describes the hardware delivered under the contract.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | MSQ-36.A | MSQ-36.B | MSQ-36.C |
| OEM/OCM or Franchised Distributor or Authorized Aftermarket Supplier | **X** |  |  |
| Assembly or Subcontracts Supplier |  | **X** |  |
| Other Supplier |  |  | **X** |

**MSQ-36.A – For Parts/Components procured from an Original Equipment Manufacturer (OEM) or Original Component Manufacturer (OCM) or Franchised Distributor or Authorized Aftermarket Supplier**

A. The supplier shall maintain a Material Authenticity program that aligns and is consistent with the intent of SAE AS5553, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition.

B. The Supplier shall not misrepresent used or reclaimed parts as new.

C. Supplier shall comply with original manufacturer’s handling, storage and shipping procedures.

D. Supplier shall provide to the Buyer all necessary certificates of conformance and acquisition traceability (CoC/T) to the OEM/OCM.

E. Supplier shall maintain objective evidence that the chain of custody has been maintained from original manufacturing of the part to the delivery of part to Buyers’ receiving dock.

**MSQ-36.B – For Circuit Card Assembly and higher-level Integration (e.g. above the piece part level) procurements and Subcontracts**

1. The supplier **shall** maintain a Material Authenticity program that aligns and is consistent with the intent of SAE AS5553, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition.
2. Supplier **shall** maintain evidence of supply chain traceability to the original component manufacturer (OCM)/original equipment manufacturer (OEM), franchised distributor, or authorized aftermarket supplier that identifies the name and location of all of the supply chain intermediaries from the component manufacturer to the direct source of the component(s) for the Supplier for any components procured in support of this Purchase Order / Subcontract or subcontract. Examples of traceability documents indicating proper component transfer from one company to another in the supply chain include but are not limited to: packing slips, receiving documents, Purchase Order / Subcontracts, and shipping documents. Certificates of Conformance from non-franchised distribution sources are not adequate to meet the supply chain traceability requirements.
3. All electrical, electronic and electro-mechanical parts delivered and/or used in the manufacture of deliverable products **shall** be from the Original Component (OCM)/Original Equipment Manufacturer (OEM), their franchised distributor or authorized aftermarket supplier.
4. If component(s) is(are) procured from an OCM/OEM-franchised distributor, the OCM/OEM-franchised distributor must obtain the component(s) to be delivered under this contract from the OCM/OEM. Supplier **shall** maintain evidence of supply chain traceability, electronic or hardcopy purchase records for these procurements. Supply chain traceability identifies the name and location of all supply chain intermediaries beginning with the component manufacturer through the direct source of the component(s) for the Supplier. Examples of traceability documents indicating proper component transfer from one company to another in the supply chain include but are not limited to: packing slips; receiving documents; Purchase Order / Subcontracts; and shipping documents.
5. If adequate supply chain traceability evidence is not obtained, then the Supplier **shall** have all components submitted to an inspection/test service provider to verify for authenticity prior to delivery. ***Northrop Grumman reserves the right to review and approve the usage of any components that do not have adequate supply chain traceability.*** Verifications **shall** be as follows:
   1. For all active electronic components, verify that component marking and packaging labeling are consistent and that component marking meets permanency and blacking topping tests. Capture high magnification digital photographs of top and bottom of one component for each date code provided in the delivery and a photograph of the packaging. Component marking and packaging labeling must be clearly legible in the photographs.
   2. For all components, inspect for manufacturer and Mil-Spec required markings and dimensions (e.g. external visual per MIL-STD-883, Method 2009), and for external counterfeit criteria.
   3. For all components, 100% (Group A) test to the applicable drawing or in accordance with the applicable industry/military requirements or manufacturer’s data sheet (static /DC parameters). The Supplier **shall** not ship product containing any component that has 100% (Group A) test failures that exceed 10% of the lot quantity, unless authorized in writing by the Buyer.
   4. For components with internal die cavities, the following are required:
      1. De-cap internal visual inspection on at least one component for each lot date code performed in accordance with MIL-STD-883, Method 2014, with digital photograph(s). The Supplier **shall** verify that die topology and markings are authentic with the OCM/OEM or by comparison to other authentic components or images.
      2. 100% x-ray inspection per MIL-STD-883 Method 2012 (digital format preferred).
      3. Supplier **shall** verify any mixed construction and/or construction anomalies within a single date code identified in the De-cap or x-ray inspection to be authentic by the OCM/OEM or validated against a known authentic component prior to shipment.
   5. The Supplier **shall** maintain verification records and results, including a copy of X-ray and digital photographs, for the components that pass the inspection and tests above. The Supplier **shall** not ship to Northrop Grumman components which fail these tests/inspections nor utilize such components in circuit card assemblies or other products delivered to Northrop Grumman.
6. The Supplier **shall** not misrepresent used or reclaimed parts as new.
7. Supplier **shall** comply with original manufacturer’s handling, storage and shipping procedures.
8. Supplier **shall** provide certificates of conformance and acquisition traceability (CoC/T) to the Buyer.
9. Supplier **shall** flow down these requirements to all of their sub-tier suppliers.

**MSQ-36.C – For all other Parts/Component Procurements**

1. The Supplier **shall** not misrepresent used or reclaimed parts as new.
2. Supplier **shall** comply with original manufacturer’s handling, storage and shipping procedures.
3. Supplier **shall** provide to the Buyer certificates of conformance and supply chain traceability. Supply chain traceability identifies the name and location of all supply chain intermediaries beginning with the component manufacturer through the direct source of the component(s) for the Supplier. Examples of traceability documents indicating proper component transfer from one company to another in the supply chain include but are not limited to: packing slips; receiving documents; Purchase Order / Subcontract; and shipping documents. Certificates of Conformance from non-franchised distribution sources are not adequate to meet the supply chain traceability requirements.
4. If evidence of supply chain traceability to the OCM/OEM is not available, Supplier **shall** submit all components to verification for authenticity prior to shipment. ***Northrop Grumman reserves the right to review and approve the usage of any components that do not have adequate supply chain traceability.*** Verification **shall** include the following:
   1. For all active electronic components, verify that component marking and packaging labeling are consistent and that component marking meets permanency and blacking topping tests. Capture high magnification digital photographs of top and bottom of one component for each date code provided in the delivery and a photograph of the packaging. Component marking and packaging labeling must be clearly legible in the photographs.
   2. For all components, inspect for manufacturer and Mil-Spec required markings and dimensions (e.g. external visual per MIL-STD-883, Method 2009), and for external counterfeit criteria.
   3. For all components, 100% (Group A) test to the applicable drawing or in accordance with the applicable industry/military requirements or manufacturer’s data sheet (static/DC parameters). The Supplier **shall** not ship product containing any component that has 100% (Group A) test failures exceed 10% of the lot quantity, unless authorized in writing by the Buyer.
   4. For components with internal die cavities, the following are required:
      1. De-cap internal visual inspection on at least one component for each lot date code performed in accordance with MIL-STD-883, Method 2014, with digital photograph(s). The Supplier **shall** verify die topology and markings are authentic with the OCM/OCM or by comparison to other authentic components or images.
      2. 100% x-ray inspection per MIL-STD-883 Method 2012 (digital format preferred).
   5. Supplier **shall** verify any mixed construction and/or construction anomalies within a single date code identified in the De-cap or x-ray inspection to be authentic by the OCM or validated against a known authentic component prior to shipment.
   6. Supplier **shall** submit the results of all verification records and results to Northrop Grumman for approval prior to shipping the deliverable products. Verification records and results **shall** include copies of x-ray and digital photographs.

MSQ-37 Material Authenticity/Counterfeit Parts

**Guidance:** Intended for programs that do not have a contractual requirement to meet the intent of AS5553. **Not to be used on any procurement issued after the date of this revision. Use MSQ-38 or MSQ-39 instead.**

***Instructions for Suppliers***

*The supplier* ***shall*** *be required to apply one of clauses MSQ-37.A, B or C to all electrical, electronic and electro-mechanical hardware procured under contract to Northrop Grumman. The supplier* ***shall*** *use the clause that most closely describes the hardware delivered under the contract.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | MSQ-37.A | MSQ-37.B | MSQ-37.C |
| OEM/OCM or Franchised Distributor or Authorized Aftermarket Supplier | **X** |  |  |
| Assembly or Subcontracts Supplier |  | **X** |  |
| Other Supplier |  |  | **X** |

**MSQ-37.A – For Parts/Components procured from an Original Equipment Manufacturer (OEM) or Original Component Manufacturer (OCM) or Franchised Distributor or Authorized Aftermarket Supplier**

* + - 1. The supplier **shall** maintain a Material Authenticity program that has as its goal the avoidance, detection, mitigation and disposition of counterfeit parts.
      2. The Supplier **shall** not misrepresent used or reclaimed parts as new.
      3. Supplier **shall** comply with original manufacturer’s handling, storage and shipping procedures.
      4. Supplier **shall** provide to the Buyer all necessary certificates of conformance and acquisition traceability (CoC/T) to the OEM/OCM.
      5. Supplier **shall** maintain objective evidence that the chain of custody has been maintained from original manufacturing of the part to the delivery of part to Buyers’ receiving dock.

**MSQ-37.B – For Circuit Card Assembly and higher-level Integration (e.g., above the piece part level) procurements and Subcontracts**

1. The supplier **shall** maintain a Material Authenticity program that has as its goal the avoidance, detection, mitigation and disposition of counterfeit parts.
2. Supplier **shall** maintain evidence of supply chain traceability to the original component manufacturer (OCM)/original equipment manufacturer (OEM), franchised distributor, or authorized aftermarket supplier that identifies the name and location of all of the supply chain intermediaries from the component manufacturer to the direct source of the component(s) for the Supplier for any components procured in support of this Purchase Order / Subcontract or subcontract. Examples of traceability documents indicating proper component transfer from one company to another in the supply chain include but are not limited to: packing slips, receiving documents, Purchase Order / Subcontracts, and shipping documents. Certificates of Conformance from non-franchised distribution sources are not adequate to meet the supply chain traceability requirements.
3. All electrical, electronic and electro-mechanical parts delivered and/or used in the manufacture of deliverable products **shall** be from the Original Component (OCM)/Original Equipment Manufacturer (OEM), their franchised distributor or authorized aftermarket supplier.
4. If component(s) is(are) procured from an OCM/OEM-franchised distributor, the OCM/OEM-franchised distributor must obtain the component(s) to be delivered under this contract from the OCM/OEM. Supplier **shall** maintain evidence of supply chain traceability, electronic or hardcopy purchase records for these procurements. Supply chain traceability identifies the name and location of all supply chain intermediaries beginning with the component manufacturer through the direct source of the component(s) for the Supplier. Examples of traceability documents indicating proper component transfer from one company to another in the supply chain include but are not limited to: packing slips; receiving documents; Purchase Order / Subcontract; and shipping documents.
5. If adequate supply chain traceability evidence is not obtained, then the Supplier **shall** have all components submitted to an inspection/test service provider to verify for authenticity prior to delivery.
   1. Northrop Grumman reserves the right to review and approve the usage of any components that do not have adequate supply chain traceability.
   2. The Supplier **shall** maintain verification records and results, including a copy of X-ray and digital photographs, for the components that pass the inspection and tests above. The Supplier **shall** not ship to Northrop Grumman components which fail these tests/inspections nor utilize such components in circuit card assemblies or other products delivered to Northrop Grumman.
6. The Supplier **shall** not misrepresent used or reclaimed parts as new.
7. Supplier **shall** comply with original manufacturer’s handling, storage and shipping procedures.
8. Supplier **shall** provide certificates of conformance and acquisition traceability (CoC/T) to the Buyer.
9. Supplier **shall** flow down these requirements to all of their sub-tier suppliers.

**MSQ-37.C – For all other Parts/Component Procurements**

1. The Supplier **shall** not misrepresent used or reclaimed parts as new.
2. Supplier **shall** comply with original manufacturer’s handling, storage and shipping procedures.
3. Supplier **shall** provide to the Buyer certificates of conformance and supply chain traceability. Supply chain traceability identifies the name and location of all supply chain intermediaries beginning with the component manufacturer through the direct source of the component(s) for the Supplier. Examples of traceability documents indicating proper component transfer from one company to another in the supply chain include but are not limited to: packing slips; receiving documents; Purchase Order / Subcontract; and shipping documents. Certificates of Conformance from non-franchised distribution sources are not adequate to meet the supply chain traceability requirements.
4. If evidence of supply chain traceability to the OCM/OEM is not available, Supplier **shall** submit all components to verification for authenticity prior to shipment. Verification **shall** include the following:
   1. Supplier **shall** submit the results of all verification records and results to Northrop Grumman for approval prior to shipping the deliverable products. Verification records and results **shall** include copies of x-ray and digital photographs.

MSQ-38 Material Authenticity/Counterfeit Part Prevention Requirements for Electronic Component Suppliers and Distributors

**Guidance:** Apply this clause when procuring electronic components.

***Instructions for Suppliers***

*The supplier* ***shall*** *be required to apply one of clauses MSQ-38.A or B to all electronic parts procured under contract to Northrop Grumman. The supplier* **shall** *use the clause based on their status as an Original Component Manufacturer (OCM) or their relationship to the OCM.*

|  |  |  |  |
| --- | --- | --- | --- |
| Supplier Status | MSQ-38.A | MSQ-38.B |  |
| Original Component Manufacturer (OCM), OCM-Franchised Distributor or OCM-Authorized Aftermarket Supplier | **X** |  |  |
| All other Suppliers of Electronic Components |  | **X** |  |

**MSQ-38.A – For Parts/Components procured from an Original Component Manufacturer (OCM), OCM- Franchised Distributor or OCM-Authorized Aftermarket Supplier**

1. The Supplier **shall** not misrepresent used or reclaimed parts as new.
2. Supplier **shall** comply with original manufacturer’s handling, storage and shipping procedures.
3. Supplier **shall** maintain and provide to the Buyer when requested all necessary certificates of conformance and acquisition traceability (CoC/T) to the OCM.
4. Supplier **shall** maintain objective evidence that the chain of custody has been maintained from original manufacturing of the part to the delivery of part to Buyers’ receiving dock.

**MSQ-38.B – For Parts/Components procured from a supplier that is not an Original Component Manufacturer (OCM), Franchised Distributor or Authorized Aftermarket Supplier for that specific Part/Component.**

**Purpose:**

To define and implement the requirements necessary for a distributor to be approved to supply electronic components to Northrop Grumman Systems Corporation (Buyer)

**Definitions: (**reference – SAE AS5553)

* AFTERMARKET MANUFACTURER**:** The manufacturer is authorized by the OCM to produce and sell replacement parts, usually due to an OCM decision to discontinue production of a part. Parts supplied are produced from materials that have been:
  + transferred from the OCM to the Aftermarket Manufacturer, or
  + produced by the Aftermarket Manufacturer using OCM tooling and intellectual property (IP).
* APPROVED SUPPLIER: Suppliers that are formally assessed, determined to provide low risk of providing counterfeit parts, and entered on a register of approved suppliers.
* AUTHORIZED DISTRIBUTION (this term is synonymous with Franchised Distribution, for the purposes of this document):Transactions conducted by an OCM-Authorized Distributor distributing product within the terms of an OCM contractual agreement. Under this distribution the distributor would be known as an Authorized Distributor.
* AUTHORIZED SUPPLIER: Suppliers authorized by the current design activity or the original manufacturer to produce and/or sell materiel (i.e., franchised distributors).
* COUNTERFEIT PART: A fraudulent part 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
* ELECTRONIC PART:Electronic components are designed and built to perform specific functions associated with control of electron flow and are not subject to disassembly without destruction or impairment of design use.Examples of electrical parts include resistors, capacitors, inductors, transformers, and connectors. Electronic parts include active devices, such as monolithic microcircuits, hybrid microcircuits, diodes, and transistors.
* INDEPENDENT DISTRIBUTOR: A distributor that purchases new materiel with the intention to sell and redistribute it back into the market. Purchased materiel may be obtained from original manufacturers or contract manufacturers (typically from excess inventories), or from other independent distributors. Resale of the purchased materiel (re-distribution) may be to original manufacturers, contract manufacturers, or other independent distributors. Independent distributors do not have legally binding relationships with current design activities or original manufacturers.
* FRANCHISED DISTRIBUTOR: A distributor with which the original manufacturer has a contractual agreement to buy, stock, re-package, sell and distribute its product lines. Franchised distributors normally offer the product for sale with full manufacturer flow-through warranty. Franchising contracts may include clauses that provide for the original manufacturer's marketing and technical support inclusive of, but not limited to, failure analysis and corrective action, exclusivity of inventory, and competitive limiters.
* FRAUDULENT PART:Any suspect part misrepresented to the customer as meeting the customer’s requirements
* HOMOGENOUS LOT:A group of parts that is received in a single shipment is identified with an identical lot (or date code) information, is identical in appearance, has been subjected to the same handling has maintained their physical placement relative to each other.
* ORIGINAL EQUIPMENT MANUFACTURER (OEM): A company that manufactures products whose design incorporates purchased components and sells those products under the company’s brand name.
* ORIGINAL COMPONENT MANUFACTURER (OCM**):** An organization that designs and/or engineers a part and is pursuing or has obtained the intellectual property rights to that part.
* SUSPECT PART:A part in which there is credible evidence that it may have been misrepresented by a supplier or manufacturer
* SUPPLY CHAIN TRACEABILTY: Documented evidence of a component’s/part’s supply chain history. This refers to documentation of all supply chain intermediaries and significant handling transactions, such as from OCM to distributor, or from excess inventory to broker to distributor.

**Supplier Quality Management System / Approved Supplier Requirements:**

A. All material delivered under the Buyer’s Authorized Purchase Order or Agreement shall be authentic and traceable to the OCM. If documented acquisition traceability is not available, Supplier shall not accept the Buyer’s Purchase Order or Agreement unless Supplier requests and receives Buyer authorization to validate the authenticity of material according to Buyer-specified requirements:

1. If Buyer authorizes the supplier to provide material without traceability supplier shall comply with the Material Authenticity Validation Requirements.

2. Supplier shall have and implement effective counterfeit parts/material prevention processes that align with AS5553 requirements:

a. Supplier Quality System and Counterfeit Prevention Plan/Processes are subject to on-site assessment by Buyer.

b. The supplier shall have and implement an effective Counterfeit Prevention Plan that documents: (a) its processes used for assuring that only authentic and conforming parts/materiel are procured and (b) its processes to be used for risk mitigation, disposition, and reporting in the event any counterfeit parts/materiel are encountered in its supply chain. The Counterfeit Prevention Plan is subject to Buyer approval, and may be disapproved at any time during the life of this Purchase Order/Subcontract if Supplier does not provide for an appropriate level of assurance for procuring authentic and conforming materiel to Buyer’s satisfaction.

c. The Supplier shall impose appropriate requirements on all tiers of its supply chain to ensure the substance of these requirements and the Buyer’s Authorized Purchase Order/Subcontract are met.

d. If the Supplier provides parts/material it obtains from sources other than the manufacturer or manufacturer-authorized distributors, the Supplier shall be a member of GIDEP and review and take appropriate corrective and preventive actions on all relevant Suspect Counterfeit GIDEP alerts.

e. Supplier shall ensure all occurrences where it has acquired and/or provided suspect counterfeit parts/material are reported as appropriate to customers and GIDEP

f. Supplier shall maintain controls for electrostatic discharge (ESD) and moisture sensitive devices which comply with ANSI-ESD S20.20 and JEDEC-STD-033, respectively.

**Buyer Audit and Surveillance Program Requirements:**

1. Buyer reserves the right to conduct periodic audits of Supplier’s Counterfeit Prevention Plan/processes and associated records. Supplier shall make available to Buyer pertinent records as necessary for Buyer to conduct audit(s). Record retention will be the responsibility of the Supplier
2. The Supplier shall ensure that Buyer and Buyer’s Customers have access to the Supplier facilities and the facilities of its supply chain at all tiers, in order to verify compliance to Buyer’s requirements
3. Prior to being approved, Supplier shall have an onsite audit performed by Buyer to verify counterfeit detection processes are in alignment with AS5553 and compliance to this requirements document

**Material Authenticity Validation Requirements:**

1. After acceptance of the PO if the Supplier discovers they are unable to comply with the supply chain traceability requirements set forth herein Supplier must contact the Buyer for further direction.
2. If Buyer authorizes the Supplier to provide electronic components/material without traceability, the Supplier shall demonstrate to the Buyer their capability to perform all necessary material authenticity validation tests and inspections. In proposing their approach to the Buyer, the Supplier should consider using industry standard practices (SAE AS5553, IDEA-STD-1010 as a guide) or utilize the services of an industry-recognized 3rd party Material Authenticity Verification Test Facility. All Material Authenticity Validation tests must be approved in advance by the Buyer.

MSQ-39 Material Authenticity/Counterfeit Parts Requirements for Suppliers and Subcontractors of Electronic Assemblies, Subsystems and Systems

**Guidance:** Apply this clause when procuring electronic assemblies, subsystems and systems.

1. The Supplier/Subcontractor (hereinafter referred to as the Supplier) **shall** maintain a Material Authenticity / Counterfeit Parts Prevention (MA/CPP) program for the avoidance, detection, mitigation and disposition of counterfeit parts. The Supplier’s MA/CPP program **shall** be aligned with and meet the intent of AS5553.
2. The Supplier **shall** flow these requirements to all levels of its Supply Chain for the procurement of items that contain electronic parts.
3. The Supplier **shall** procure electronic parts from the Original Component Manufacturer (OCM), OCM-Franchised Distributers or OCM-Authorized Aftermarket Manufacturers. If the Supplier is unable to procure electronic parts from the aforementioned sources, the Supplier may establish one or more “Trusted Suppliers” who have been audited by the Supplier to AS5553 and been confirmed to have a MA/CPP program that is aligned with AS5553.
4. The Supplier **shall** ensure that all electronic parts used in their deliverable products have full traceability to the OCM and positive control of Chain of Custody from the OCM to the Supplier’s deliverable end item to Northrop Grumman.
5. If any electronic parts, including those of sub-tier suppliers used in the Supplier’s deliverable products do not meet the requirements of (D), the Supplier **shall** notify the Buyer before using these parts. The Supplier may propose to the Buyer their recommendation for resolving the lack of traceability and/or lack of positive chain of custody. The Buyer **shall** be afforded the opportunity to approve any electronic parts usage that does not meet the requirements of (D).The Supplier should consider the following methods for resolution:
   * 1. Inspection in accordance with IDEA-STD-1010
     2. Testing in accordance with AS5553
     3. Selection of an alternate supplier with full Certificate of Conformance (CoC) and Certificate of Traceability (CoT) to the OCM
     4. Selection of an alternate part with full CoC/CoT to the OCM
6. The Supplier **shall** not misrepresent used or reclaimed parts as new.
7. Supplier **shall** comply with original manufacturer’s handling, storage and shipping procedures.
8. Supplier **shall** provide to the Buyer, upon request, all electronic parts certificates of conformance and acquisition traceability (CoC/CoT) to the OEM/OCM.
9. The Supplier **shall** be a member of GIDEP if eligible and **shall**:

1. Notify the Buyer of any instances where GIDEP Suspect Counterfeit Alerts could affect the Supplier’s products that are deliverable to Northrop Grumman

2. Report any instances involving Suspect Counterfeit Parts discovered during the performance of their contract with Northrop Grumman to GIDEP and the Buyer

1. The Buyer reserves the right to audit the Supplier’s MA/CPP program at the Supplier’s facility and at the Supplier’s suppliers’ facilities when accompanied by the Supplier.

MSQ-40 Material Authenticity/Counterfeit Part Prevention Requirements for Non-Electronic Material Suppliers and Distributors

**Guidance:** Apply this clause when procuring non-electronic material.

**Purpose:**

Define and implement the requirements for Material Authenticity for Northrop Grumman suppliers and distributors of non-electronic material.

**Definitions:**

MATERIEL: Materiel in this clause refers to material, parts, assemblies, and other procured items (except for electronic parts)

MANUFACTURER: Manufacturer in this clause refers to the point of origin of any materiel covered by the clause including factories, mills, foundries, mines, chemical plants, laboratories, etc.

SUSPECT MATERIEL: Materiel, items, or products in which there is an indication by visual inspection, testing, or other information that it may meet the definition of fraudulent materiel or counterfeit materiel provided below.

FRAUDULENT MATERIEL: Suspect materiel misrepresented to the customer as meeting the customer’s requirements.

COUNTERFEIT MATERIEL: 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.

IDENTITY: Information such as the current design authority, original manufacturer, trademark or other intellectual property, performance, unique item identifier, part number, date code, lot number, testing methods and results, inspection, documentation, warranty, origin, ownership history, packaging, storage, handling, physical condition, previous use, etc.

AUTHENTIC: Produced with legal right or authority granted by the legally authorized source.

AFTERMARKET MANUFACTURER: A manufacturer that meets one or both of the following criteria:

a. The manufacturer is authorized by the original manufacturer to produce and sell replacement materiel, usually due to an original manufacturer decision to discontinue production of materiel. Materiel supplied is produced from dies, molds, or other manufacturing equipment that has been

1. transferred from the original manufacturer to the aftermarket manufacturer,

2. produced by the aftermarket manufacturer using original manufacturer tooling and intellectual property (IP), or

3. produced by the aftermarket manufacturer through redesign to match the original manufacturer’s specifications without violating the original manufacturer’s intellectual property rights (IPR), patents, or copyrights.

b. The manufacturer produces materiel by emulating or reverse-engineering obsolete materiel to satisfy continuing customer needs without violating the original manufacturer’s intellectual property rights, patents, or copyrights.

APPROVED SUPPLIER: Suppliers that are formally assessed by the current design activity or the original manufacturer, determined to be a trusted source that will reliably provide authentic and conforming materiel and entered on a register of approved suppliers.

AUTHORITY HAVING JURISDICTION: A statutory authority can differ between countries, the term is used to refer to the governmental organization at the federal, national, state, or local entity having statutory authority to respond to, enforce, or prosecute anti-counterfeiting laws. Examples are Customs and Judicial bodies.

AUTHORIZED RESELLER: An entity that has a legally binding relationship with the legally authorized source, but does not provide direct product support to the customer.

AUTHORIZED SUPPLIER: Aftermarket manufacturers as defined above, and suppliers authorized by the current design activity or the original manufacturer to produce and/or sell materiel (i.e., franchised distributors).

BROKER: In the independent distribution market, brokers are professionally referred to as independent distributors. See definitions for “broker distributor” and “independent distributor”.

BROKER DISTRIBUTOR: A type of independent distributor that works in a “Just in Time” (JIT) environment. Customers contact the broker distributor with requirements identifying information such as the part number, quantity, target price, and date required. The broker distributor searches the industry and locates parts or other materiel that meet the target price and other customer requirements.

CERTIFICATE OF AUTHENTICITY (C of A): A statement to the effect that all materiel items listed above furnished on this contract are genuine, new and unused unless otherwise specified in writing herein; are suitable for the intended purpose; are not defective, suspect, or counterfeit; have not been provided under false pretenses; and have not been materially altered, damaged, deteriorated, or degraded.

CERTIFICATE OF CONFORMANCE (C of C, CoC): A document provided by a supplier formally declaring that all Buyer purchase order requirements have been met. The document may include information such as manufacturer, distributor, quantity, lot and/or date code, inspection date, etc., and is signed by a responsible party for the supplier.

CERTIFICATE OF CONFORMANCE AND TRACEABILITY (CoCT): A certificate of conformance required by certain U.S.military specifications which requires documented traceability from the QPL/QML manufacturer through delivery to the U.S. Government if the material is not procured directly from the approved manufacturer.

COMMODITY LEVEL TRACEABILITY: The requirement to trace lifecycle management to a commodity for specified events related to acquisition, validation of authenticity, property accountability, storage, operation, maintenance, safety, physical security, retirement, and disposal by each commodity, e.g., a stock numbered product and/or a lot or batch of a product.

CURRENT DESIGN ACTIVITY: The organizational entity currently responsible for the design of materiel. This may be the original design activity or a design activity to which the design responsibility has been transferred.

DESTRUCTIVE TESTING: A systematic, logical, detailed examination of materiel during various stages of physical disassembly, conducted on a sample of completed materiel from a given lot, wherein materiel is examined for a wide variety of design, workmanship, and/or processing problems. Information derived from destructive testing may be used to:

a. preclude installation of inauthentic materiel or materiel having obvious or latent defects

b. aid in disposition of materiel that exhibits anomalies

c. aid in defining improvement changes in design, materials, or processes

d. evaluate supplier production trends

DISPOSITION: Decisions made by authorized representatives within an organization concerning future treatment of nonconforming materiel. Examples of dispositions are to scrap, mutilation, use-as-is (normally accompanied by an approved variance/waiver), retest, rework, repair, or return-to-supplier.

FRANCHISED DISTRIBUTOR: A distributor with which the original manufacturer has a contractual agreement to buy, stock, re-package, sell and distribute its product lines. Franchised distributors normally offer the product for sale with full manufacturer flow-through warranty. Franchising contracts may include clauses that provide for the original manufacturer's marketing and technical support inclusive of, but not limited to, failure analysis and corrective action, exclusivity of inventory, and competitive limiters.

GIDEP (GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM): A cooperative activity between U.S. and Canadian government and industry participants seeking to reduce or eliminate expenditures of resources by sharing technical information essential during research, design, development, production and operational phases of the life cycle of systems, facilities and equipment.

INDEPENDENT DISTRIBUTOR: A distributor that purchases new materiel with the intention to sell and redistribute it back into the market. Purchased materiel may be obtained from original manufacturers or contract manufacturers (typically from excess inventories), or from other independent distributors. Resale of the purchased materiel (re-distribution) may be

to original manufacturers, contract manufacturers, or other independent distributors. Independent distributors do not have legally binding relationships with current design activities or original manufacturers.

ITEM LEVEL TRACEABILITY: The requirement to trace lifecycle management to an individual item for specified events related to acquisition, validation of authenticity, property accountability, storage, operation, maintenance, safety, physical security, retirement, and disposal by a single instance of an item.

ITEM UNIQUE IDENTIFICATION (IUID): IUID is a materiel identification system instituted by the United States Department of Defense (DoD) in accordance with International Organization for Standards (ISO) standards including ISO 15459 to uniquely identify a discrete tangible item and distinguish it from other like and/or unlike tangible items. Tangible items are distinguished from one another by the assignment of a unique item identifier (UII) in the form of a unique data string and encoded in a Data Matrix bar code symbol which is placed on the item. The same approach has been adopted by the North Atlantic Treaty Organization, the Air Transport Association, American National Standards Institute, individual companies, etc. A UII is only assigned to a single instance of an item and is never reused. Once assigned to an item, the UII is never changed, even if the item is modified or re-engineered.

LEGALLY AUTHORIZED SOURCE: The current design activity or a supplier authorized by the current design activity or the original manufacturer to produce an item.

NONDESTRUCTIVE TESTING (NDT): Can also be described as Nondestructive Inspection (NDI) or Nondestructive Evaluation (NDE). NDT encompasses a wide variety of analytical techniques used in science and industry to evaluate the properties of materials, components, subcomponents, or systems without damaging or permanently altering them.

OPEN MARKET: The trading market that buys or consigns primarily original manufacturers’ and contract manufacturers’ excess inventories of new materiel and subsequently utilizes these inventories to fulfill supply needs of other original manufacturers and contract manufacturers, often due to urgent or obsolete materiel demands.

ORGANIZATION: In the context of this document, it refers to procurement and design activity entities (government and contractor), and sub-tier materiel suppliers and producers.

ORIGINAL MANUFACTURER: An organization that designs and/or engineers and produces materiel and is pursuing or has obtained the intellectual property rights to that materiel. Notes:

a. The materiel and/or its packaging are typically identified with the original manufacturer’s trademark.

b. Original manufacturers may contract out manufacturing and/or distribution of its product.

c. Different original manufacturers may supply product for the same application or to a common specification.

PACKAGING: Packaging refers to the manner in which materiel is packaged in preparation for use. The determination of packaging types is determined by product sensitivities such as moisture, physical characteristics, etc., as well as the method (manually, or by use of automated equipment) to be used to place the materiel into its application.

REFURBISHED: Materiel that has been cleaned, freshened, painted, polished or renovated in an effort to restore it to a “like new” condition.

RESELLER: An entity providing materiel that may or may not have a legally binding relationship with the legally authorized source and is serving only as an agent of the transaction.

STOCKING DISTRIBUTOR: A type of independent distributor that stocks large inventories typically purchased from original manufacturers and contract manufacturers. The handling, chain of custody, and environmental conditions for materiel procured from stocking distributors is generally better known than for product bought and supplied by broker distributors.

SUPPLIER: Within the context of this document, a blanket description of all sources of supply for a materiel (e.g., original manufacturer, franchised distributor, independent distributor, broker distributor, stocking distributor, aftermarket manufacturer) who may or may not have a legally binding relationship with the legally authorized source. This relationship generally includes direct product support, training and marketing support from the legally authorized source and provides direct product support to the customer.

SUPPLY CHAIN TRACEABILITY: Documented evidence of materiel’s supply chain history. This refers to documentation of all supply chain intermediaries and significant handling transactions, such as from original manufacturer to distributor, or from excess inventory to broker to distributor.

UNIQUE ITEM IDENTIFIER (UII): A globally unique and unambiguous identifier that distinguishes an item from all other like and unlike items. The UII is a concatenated value that is derived from a UII data set of one or more data elements encoded in an IUID compliant Data Matrix bar code symbol. The UII is intended to be a permanent mark placed on a single instance of an item of materiel and cannot be changed over the life of that item.

UNUSED (NEW SURPLUS): Materiel that has not been previously used. A shipment of unused materiel can contain mixed date codes, lot codes, or countries of origin, and should be received in unused factory or third party packaging. The materiel may have minor scratches or other physical defects as a result of handling, but should be in good condition and should not be refurbished. The materiel should be guaranteed to meet the manufacturer’s full specifications.

UPRATED: Assessment which results in the extension of materiel ratings to meet the performance requirements of an application in which the materiel is used outside the manufacturer’s specification range.

UPSCREENED: Additional materiel testing performed to produce materiel verified to specifications beyond the standard materiel’s rated parameters.

USED (REFURBISHED OR PULLED): Materiel that has been installed and used, but subsequently removed from its application. Used materiel may be received in non-standard packaging (i.e., bulk), and may contain mixed lots, date codes, be from different facilities, etc. Materiel may have physical defects such as scratches, faded markings, chemical residue or other signs of use, but should be intact. Used materiel may be sold with a limited warranty. Used materiel marketed as refurbished should meet the industry definition of refurbished, or should be sold as used or pulled product.

**Supplier Quality Management System / Approved Supplier Requirements:**

* 1. All material delivered under the Buyer’s Authorized Purchase Order or Agreement **shall** be authentic and traceable to the original manufacturer or mill/plant for raw materials. If documented acquisition traceability is not available, Supplier **shall** not accept the Buyer’s Purchase Order or Agreement unless Supplier requests and receives Buyer authorization to validate the authenticity of material according to Buyer-specified requirements:

1. If Buyer authorizes the supplier to provide material without traceability supplier shall comply with the Material Authenticity Validation Requirements.

2. Supplier shall have and implement effective counterfeit parts/material prevention processes that align with the requirements set forth herien:

a. Supplier Quality System and Counterfeit Prevention Plan/Processes are subject to on-site assessment by Buyer.

b. The supplier shall have and implement an effective Counterfeit Prevention Plan that documents: (a) its processes used for assuring that only authentic and conforming parts/materiel are procured and (b) its processes to be used for risk mitigation, disposition, and reporting in the event any counterfeit parts/materiel are encountered in its supply chain. The Counterfeit Prevention Plan is subject to Buyer approval, and may be disapproved at any time during the life of this Purchase Order/Subcontract if Supplier does not provide for an appropriate level of assurance for procuring authentic and conforming materiel to Buyer’s satisfaction.

c. The Supplier shall impose appropriate requirements on all tiers of its supply chain to ensure the substance of these requirements and the Buyer’s Authorized Purchase Order/Subcontract are met.

d. If the Supplier provides parts/material it obtains from sources other than the manufacturer or manufacturer-authorized distributors, the Supplier shall be a member of GIDEP and review and take appropriate corrective and preventive actions on all relevant Suspect Counterfeit GIDEP alerts.

e. Supplier shall ensure all occurrences where it has acquired and/or provided suspect counterfeit parts/material are reported as appropriate to customers and GIDEP

f. Supplier shall maintain controls for electrostatic discharge (ESD) and moisture sensitive devices which comply with ANSI-ESD S20.20 and JEDEC-STD-033, respectively.

**Buyer Audit and Surveillance Program Requirements:**

A. Buyer reserves the right to conduct periodic audits of Supplier’s Counterfeit Material Protection Plan/processes and associated records. Supplier **shall** make available to Buyer pertinent records as necessary for Buyer to conduct audit(s). Record retention will be the responsibility of the Supplier

B. The Supplier **shall** ensure that Buyer and Buyer’s Customers have access to the Supplier facilities and the facilities of its supply chain at all tiers, in order to verify compliance to Buyer requirements

C. Prior to being approved, Supplier **shall** have an onsite audit performed by Northrop Grumman Systems Corporation to verify counterfeit material detection processes are in alignment with applicable industry and regulatory standards (e.g. AS6174) and are in compliance to this requirements document.

**Material Authenticity Validation Requirements:**

A. After acceptance of the PO if the Supplier discovers they are unable to comply with the supply chain traceability requirements set forth herein Supplier must contact the Buyer for further direction.

B. If Buyer authorizes the Supplier to provide material without traceability, the Supplier **shall** demonstrate to the Buyer their capability to perform all necessary material authenticity validation tests and inspections. In proposing their approach to the Buyer, the Supplier should consider using industry standard practices (SAE AS6174 draft as a guide) or utilize the services of an industry-recognized 3rd party Material Authenticity Verification Test Facility. All Material Authenticity Validation tests must be approved in advance by the Buyer.

MSQ-41 Authenticity Validation Requirements for Electronic Components/Parts

**Guidance:** **The following requirements and definitions are applicable to all paragraphs of this clause**

|  |  |  |  |
| --- | --- | --- | --- |
| Applicable Documents:  The version of the applicable documents is the revision in effect as of the date of the purchasing agreement  MIL-STD-883 Test Method Standard- Microcircuits  IDEA-STD-1010 Acceptability of Electronic Components Distributed in  the Open Market   |  |  | | --- | --- | |  |  |   **Definitions:**  ELECTRONIC PART: Electrical, Electronic, and electro-mechanical (EEE)components are designed and built to perform specific functions associated with control of electron flow and are not subject to disassembly without destruction or impairment of design use. Examples of these parts include resistors, capacitors, inductors, transformers, connectors, active devices, such as monolithic microcircuits, hybrid microcircuits, diodes, and transistors.  HOMOGENOUS LOT: A group of parts that is received in a single shipment is identified with an identical lot (or date code) information, is identical in appearance, has been subjected to the same handling has maintained their physical placement relative to each other.  ORIGINAL COMPONENT MANUFACTURER (OCM): An organization that designs and/or engineers a part and is pursuing or has obtained the intellectual property rights to that part. | |
| A.Documentation -The results of all verification tests and inspections and disposition about the authenticity of the material shall be recorded. At a minimum, that record shall include the following:   1. Purpose of Test 2. Test Engineer Name 3. Part Number 4. Lot number and date codes 5. Device Type 6. Device Manufacturer 7. Country of Origin 8. Test Location 9. Tester Hardware information (model number, serial number) 10. Load board number 11. Parameters tested, temperature 12. Quantity tested   B. The supplier **shall** be required to maintain verification records and results, including a copy of X-ray and digital photographs, for the components that are subjected to the inspection and tests above. The supplier **shall** not ship to Northrop Grumman as conforming items components which fail these tests/inspections nor utilize such components in circuit card assemblies or other products delivered to Northrop Grumman. Northrop Grumman reserves the right to obtain all components that fail these tests/inspections to support any counterfeit part investigations and reporting requirements to the appropriate Government agencies.  C.The supplier **shall** be required to maintain a separate copy of validation results and disposition. Copies **shall** be provided to Northrop Grumman in accordance with purchase order requirements or upon request. | |
| MSQ-41a  **Electronic Component Authenticity Validation Requirements**  A.The following set of tests constitutes a minimum standard for use to mitigate procurement risk as well as in verification of suspect/counterfeit parts.   1. Test/Inspection Sampling Plan   For all testing, a standard lot is considered to be a homogeneous lot. Test samples **shall** be selected at random, however for lots with mixed date codes, the devices must be separated into separate sublots where minimum sample size applies to each sublot. Samples **shall** be randomly selected from the total population. The same samples may be used for multiple tests.  The following suite of tests is intended to supplement product acceptance tests.   1. Packaging Inspection   For all active electronic components, verify that component marking and packaging labeling are consistent (100% of parts) and are authentic with the OCM/ OEM/ AAM or by comparison to other authentic components or images.   1. External Visual Inspection   For all packaged components, inspect for manufacturer and Mil-Spec required markings, dimensions and workmanship (e.g., external visual per Mil-Std-883, Method 2009), and for external counterfeit criteria per IDEA-STD-1010 (100% of parts).  For bare die products, inspect for consistent markings on the die and the wafer packaging and verify die size and geometry (visual inspection per Mil-Std-883, Method(S) 2010, 2017, 2032 as applicable). The supplier **shall** verify die topology and markings are authentic with the OCM/ OEM/ AAM or by comparison to other authentic components or images. Mixed construction **shall** be cause for rejection.   1. Solvent Test for Remarking and Resurfacing   Verify that component marking meets Remarking and Resurfacing tests (3 parts per date code). Capture high magnification digital photographs of top and bottom of one component for each date code provided in the delivery and a photograph of the packaging. Component marking and packaging labeling must be clearly legible in the photographs.   1. Remarking - Marking Permanency   For packaged components and Plastic Encapsulated Microcircuits (PEMs), perform per Mil-Std-883 Method 2015, Resistance to Solvents or JESD22-B107C Marking Permanency. Record any changes or smearing of the marking as a result of the test. | |
| 1. Resurfacing (Blacktopping)   For packaged components and PEMs, perform the following sequence of tests, recording changes to the part’s surface:  a. Acetone Test– Wipe a cotton swab dipped in Acetone across the surface of the part. Observe and record any surface changes, surface texture, scratches or other irregularities in the area where the acetone was applied. Record whether the swab turns black and if the wiped section changes color.  b. Scrape Test - if there is evidence of a clear coat not attacked by the acetone, mechanically scrape the surface with a sharp blade. Record observations of surface changes making note of any surface flaking or if previous marking is visible.  c. Heated Solvent Test (Dynasolve 750 or Uresolve Plus or equivalent) - Perform according to the manufacturers recommendations. Record observation of surface irregularities such as scratch marks.   1. Delid/ Decapsulation Internal Analysis   For PEM and packaged components with internal die cavities, at least one component for each date code **shall** be delidded/ decapsulated and examined for internal package or die construction in accordance with Mil-Std-883, Method 2014, with digital photograph(s). The supplier **shall** verify die topology and markings are authentic with the OCM/ OEM or by comparison to other authentic components or images.   1. X-Ray Inspection   For PEM and packaged components with internal die cavities, unless the Supplier requests and obtains from Northrop Grumman Supplier Mission Assurance approval of an exception, the supplier **shall** perform 100% X-Ray inspection per Mil-Std-883 Method 2012 (digital format preferred).  Note: Supplier **shall** verify any mixed construction and/or construction anomalies within a single date code identified in the delidding/ decapsulation or X-ray inspection to be authentic by the OCM/ OEM or validated against a known authentic component prior to shipment.   1. Functional Testing   For all packaged components, 100% of the components **shall** be tested to all specified limits of all Group A static DC parameters at ambient temperature specified per the applicable drawing or in accordance with the applicable industry/military requirements or manufacturer's data sheet. The Supplier **shall** hold the lot for NGC review if Group A test failures exceed 10% of the lot quantity. Product containing these components may not be shipped unless authorized in writing by the Buyer. | |
|  |  |
| MSQ-41 b  A. Electronic Component Authenticity Validation Requirements  When Northrop Grumman has determined that the impact of the supply chain risk and the likelihood of the counterfeiting occurrence results in high risk, additional testing is required. Perform from the following in accordance with the guidance provided by Northrop Grumman Mission Assurance. Use no greater than 10% AQL for testing of smaller lot sizes and 10% LTPD for larger lots.   * Digital photographs of top and/or bottom marking and configuration of all components * Digital photographs of unit container packaging and packaging marking for all components * Cross-sectional analysis * X-ray Fluorescence (XRF) Testing * SEM or spectrographic analysis * DC Parametric Test * Functional Test * AC Parametric Test * DC Parametric Test at Specified Temperature Extreme(s) * Functional Test at Specified Temperature Extreme(s) * AC Parametric Test at Specified Temperature Extreme(s) * Other tests and/or inspections defined for the individual situation | |

MSQ-42 Information Technology (IT) Services Management for suppliers providing IT services

**Guidance:** Select any one of A, B, C, or D

A. ISO 20000 Compliant

1. Seller shall provide and maintain an IT Service Management System that is compliant to ISO 20000

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having a successful audit performed by Buyer.

B. ISO 20000 Registered

1. Seller **shall** provide and maintain an IT Service Management System that is registered to ISO 20000

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having an ISO 20000Certification from an accredited registrar.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s IT Service Management System

C. Information Technology Infrastructure Library (ITIL) Compliant

1. Seller **shall** provide and maintain an IT Service Management System that is compliant to ITIL.

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having a successful audit performed by Buyer.

D. ITIL Certified

1. Seller **shall** provide and maintain an IT Service Management System that is certified to ITIL

2. Seller’s capability to perform satisfactorily to these requirements **shall** be demonstrated by having an ITIL Certification of appropriate personnel from an accredited registrar.

a. Buyer **shall** reserve the right to conduct an assessment of Seller’s IT Service Management System

MSQ-43 Calibration Services Requirements for Supplier Providing Calibration

**Guidance:** A, B, and C apply when MSQ-43 is required

A. Seller **shall** be responsible for the calibration and applicable maintenance of any equipment, tooling, or gauges provided from the Buyer to the Seller under this procurement agreement.

B. Seller‘s equipment calibration system **shall** be in accordance with one of the four requirements listed below:

1. MIL-STD-45662A

2. ANSI/NCSL Z540

3. ISO 10012-1

4. ISO 17025

1. Seller **shall** provide a data package for each service that meets the requirements of the above standards including as found and final results, acceptance criteria, and traceability to applicable national standards.

MSQ-44 Maintenance Services Requirements

**Guidance:** A, B, C, D, and E **shall** apply when MSQ-44 is required

A. Seller **shall** be responsible for the maintenance of any equipment provided to seller under this procurement agreement and as defined in the manufacturer’s manuals, warranty agreement and/or Return Material Authorization (RMA) agreement.

B. Seller‘s repair will use equipment that is calibrated and **shall** be in accordance with MSQ-11.

C. Seller **shall**, as a minimum, maintain any equipment provided by the seller under the same terms, conditions and quality clauses as the original purchase, including the use of qualified processes and personnel as designated in the manufacturer’s manual unless otherwise specified by the maintenance purchasing agreement.

D. Seller, during the maintenance/repair, **shall** be in accordance with MSQ-1A.

E. Upon completion of the maintenance/repair, the Seller **shall** prepare a data package providing evidence that the maintenance was performed as required, including the nature of the actions performed and acceptance results. Handling and storage should be as specified in MSQ-1 part L.

MSQ-45 Service Requirements

**Guidance:** A and B apply when MSQ-45 is selected

1. The Seller **shall** establish and implement a service plan that includes:
2. Provisions for ensuring personnel performing the service have the education, experience, knowledge and/or combination to successfully deliver the service.
3. Key measures of service performance including action thresholds. Key measures to be used to gauge the consistency, efficiency and effectiveness of the service being provided.
4. Specific actions to take when performance measurements indicate that the service is not meeting expectations.
5. A means to obtain and incorporate customer feedback on service performance.
6. A method to continually improve the level of service.
7. The Seller **shall** institutionalize the service plan as part of their standard management system.

MSQ-46 Staff Augmentation

A. The Seller **shall** establish and implement a staffing plan that includes:

1. Provisions for ensuring personnel have the education, experience, knowledge and/or combination to successfully perform job responsibilities.
2. A system to measure and communicate individual and team performance.
3. Specific actions to take when performance measurements indicate that resources are not meeting expectations.
4. A means to communicate staffing changes to the Buyer. The Buyer reserves the right to approve staffing changes for those positions deemed critical.
5. A method to reward and incentivize employees.

B. The Seller **shall** institutionalize the staffing plan as part of their standard management system

4.0 Acronyms

**Guidance:** Include all acronyms used in this plan.

The following acronyms are used in this plan.

| **Acronym** | **Definition** |
| --- | --- |
| AS | Aerospace Standard |
| CMMI | Capability Maturity Model Integration |
| CTF | Critical to Function |
| DFARS | Defense Federal Acquisition Regulation Supplement |
| DoD | Department of Defense |
| DSA | Defense Supply Agency |
| ECP | Engineering Change Proposal |
| EIDP | End Item Data Package |
| ESD | Electrostatic Discharge |
| FOD | Foreign Object Debris |
| GIDEP | Government Industry Data Exchange Program |
| ISO | International Organization for Standardization |
| MIL | Military |
| MRB | Material Review Board |
| MSDS | Material Safety Data Sheet |
| NASA | National Aeronautics and Space Administration |
| NIST | National Institute for Standard Technology |
| QPL | Qualified Parts List |
| SEI | Software Engineering Institute |
| SEM | Scanning Electron Microscope |
| UID | Unique Identification |