



Document Number: SCM-004-FRM

# Common Supplier Quality Clauses SCM-004-FRM

## *NOTE*

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**CHANGE HISTORY**

Record of Changes			
Revision	Description	Date	Approval
	Initial release as corporate level document	01/11/18	SDEM
A	Modified Sec 8.1 to clarify Series 100 series. Deleted QC100.1 and incorporated into QC100; QC104 added record editing requirement; Combined 104.3, 4 and 5 and relabeled to new code QC363; added QC362 false, fictitious, and fraudulent; modified QC210.1	03/22/18	Corporate Supplier Development Engineering
B	Adding DRS PTI (Fitchburg) specific quality clauses: QC111.1 – Control of Lower-Tier Supplier, QC208.1-Magnetic Core Packaging, QC210.4 Special Process Procedure Approval Required, QC221.8 – AS9102 First Article Inspection, 312.18 Data Deliverables: Inspection Reports, QC360.1 Counterfeit Material: Assuring Acquisition of Authentic Conforming Material, QC364 Contractor Requirements, QC365 GE Environmental Stress	05/07/18	Corporate Supplier Development Engineering
C	Revision of QC103 to change requirement from Z540.3 to Z540.1 Added QC366, Material / Product Conformance Revised QC101.1 to reflect change in Corporate Brokerage company for Customs clearance. Added page numbering to document	08/28/18	Corporate Supplier Development Engineering
D	Revision of QC121 to change last bullet from “As requested by DRS” to “As requested by DRS, and called out separately on the PO”	12/06/18	Corporate Supplier Development Engineering
E	Added QC367, QC367.1 - QC367.11, QC368, QC368.1 - QC368.5, QC369, QC370, QC370.1 - QC370.3, QC371, QC371.1 - QC371.5, QC372, QC373, QC373.1 - QC373.2, Corrected header on page 8 to link to previous. Formatted this table for consistency.	12/13/18	Corporate Supplier Development Engineering
F	Added QC113.1, CoC, specific to Naval Power Systems, Revised QC210.4, Special Process, specific to Naval Power Systems, Added QC222, Advanced Product Quality Planning and First Article Inspection, specific to Naval Power Systems.	06/15/19	Corporate Supplier Development Engineering
G	Added QC120.I, Foreign Object Debris (FOD) Prevention and Part Cleanliness – AS9146 & NAS 412.” Added guidance notes for franchised distributors on QC103, QC104, QC113, QC122, QC201 and QC369. Amended QC106, QC113 and QC203.2, QC330. Added QC211.2, QC319.2, QC370.4, QC374, and QC375, QC376, QC376.1, QC377 and QC377.1	10/02/19	Corporate Supplier Development Engineering

<b>Record of Changes</b>			
<b>Revision</b>	<b>Description</b>	<b>Date</b>	<b>Approval</b>
H	Modified QC221.3 – First Article Inspection specific requirements for Danbury, CT to detail requirements for as requested items on purchase orders. Created new QC Code 101.4 for Daylight Solutions to remove the requirement for “tamper-evident package.”	2/28/20	Bill DeMalia EOIS Melbourne Quality Director
I	Added QC104.2 – Quality Records eliminated requirement for suppliers to notify DRS when records are to be destroyed. Added QC312.10.1 – Data Deliverables: Welding Certifications Land Systems Added QC378 - Process Validation (PVA) / Frozen Process (FP) – NIS Modified QC104 – Removed Note on Franchised Distributors Modified QC221.3 – 1 <sup>st</sup> Article Inspections Danbury, CT; significant additional requirements included Modified QC113 – Certificate of Compliance – Reduced requirements	5/13/20	Bill DeMalia NIS Supplier Performance Management Director
J	Updated QC113.1 to remove line 9 and renumber the subsequent lines. Statement removed, “Name of lower-tier supplier and description of service provided (if applicable); ref QC 210”	9/2/20	J. Godwin, EOIS Director, Supplier Performance Management
K	Updated QC102 to comply with new revision of AS5553	10/6/20	J. Godwin, EOIS Director, Supplier Performance Management
L	Update Land Systems QC221.5 and QC221.6 for cybersecurity requirements on transfer of CUI materials to/from suppliers	12/18/20	J. Godwin EOIS Director, Supplier Performance Management
M	Update QC104 and QC113.1 in support of NPS customer PO requirements	2/25/21	J. Godwin, EOIS Director, Supplier Performance Management
N	Update QC221.1 to specify additional requirements for submission of AS9102 FAIRs. Update QC204.1 to add detail and clarity on requirement	5/12/21	J. Godwin, EOIS Director, Supplier Performance Management
P	Update QC113 for clarification of C of C requirements	6/22/21	C. Ossenfort, Corporate VP Quality
R	Updates to QC122 to specify process changes	11/23/21	J. Godwin, EOIS Director,

Record of Changes			
Revision	Description	Date	Approval
			Supplier Performance Management
T	Update QC221.8 FAIR submission timing requirement (from 18 months to 24 months) Add QC202.1 for ESD packaging requirements specific to Milwaukee. Update QC221.1 to cover all types of DRS or customer controlled drawings that require FAIR/Delta FAIR submissions. Format update	6/27/22	J. Godwin, EOIS Director, Supplier Performance Management
U	Update typo in QC202.1 Update title of QC104, 104.1, and 104.2 from "Control of Quality Records" to "Control of Manufacturing, Testing, and Inspection Records" Update QC117.1 reference to SVR form from DQP-SP-052A to SEP-00-06-F01-CCI	7/29/22	J. Godwin, EOIS Director, Supplier Performance Management
V	Add QC221.9 for Daylight Solutions Update QC113.1 by removing "PO Quantity"	9/20/22	J. Godwin, EOIS Director, Supplier Performance Management
W	Add QC111.2 and QC114.1 for Danbury Update QC378 reference form and title from "Form #365, PROCESS VALIDATION ASSESSMENT (PVA) INFORMATION TEMPLATE / FROZEN PROCESS (FP)" to "Form 84-FRM-00-01, Supplier Validation – Frozen Process"	5/22/23	J. Godwin, EOIS Director, Supplier Performance Management
Y	Update QC114.1 – title change from "Parts Substitution Including Electrical Components – Danbury" to "Parts Substitution Less Packaging." Update QC122 – modify language to meet intent Update QC221.3 – modify language in last paragraph. Update QC221.6 - remove email notification requirements	8/24/23	J. Godwin, EOIS Director, Supplier Performance Management
AA	Add QC223 – Supplier Kickoff Meetings / Production Readiness Reviews Add QC110.1 – Notification of Non-conformances Responsibility – Daylight Solutions Update QC221.3 to add weight measurement requirement for FAIRs Update QC111.2 – fix clause callout from QC114 to QC114.1 Update QC312.8 – rewrite to specify requirements for metallic and non-metallic materials Update QC113.1 – update bullet 8 for clarity Reformatted entire document	11/17/23	J. Godwin, EOIS Director, Supplier Performance Management

Record of Changes			
Revision	Description	Date	Approval
AB	Update QC117.1 – add prohibited materials and update scope to NPS Update QC363 – clarify requirements for witness samples and coating scan deliverables Add QC379 – Digital Product Definition at Boeing Suppliers Update QC221.5 and QC221.6 – remove erroneous spaces from email accounts Update QC114.1 – clarify notification requirements Update QC101 and QC101.4 – remove obsolete revision reference Update QC205 – direction on filling unused contacts Update QC312.2 – clarify requirements for dimensional report Update QC113.1 – clarify requirements for distributors	3/4/24	J. Godwin, EOIS Director, Supplier Performance Management
AC	Update QC113.1 – bullet 5 for clarity Add QC221.10 – First Article Inspection Specific Requirements for Fort Walton Beach Add QC380 – Advanced Product Quality Planning – Naval Electronics	6/17/24	J. Godwin, EOIS Director, Supplier Performance Management

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- 1. Purpose**

The purpose of this document is to identify common quality clauses used on Purchase Orders (PO's) by Leonardo DRS facilities using this document, hereinafter referred to as DRS.
- 2. Introduction**

This procedure applies to all Leonardo DRS sites and its suppliers. It is intended to establish common language for supplier quality requirements related to DRS generated PO's.
- 3. Process Owner**

DRS Supplier Development Engineer
- 4. Responsibility**

The DRS Supplier Development Engineering is responsible for the development and control of common supplier quality clauses.
- 5. Stakeholders**

The stakeholders are the Quality and Supply Chain personnel at each Leonardo DRS site who use these clauses.
- 6. Referenced Documents**

No specific revision numbers of documentation are called out in this document. The latest revision of the referenced document should be used.

## 7. Acronyms and Definitions

ABL	As Built List
CCA	Circuit Card Assembly
C of A	Certificate of Analysis
C of C	Certificate of Conformance (or Compliance)
C of T	Certificate of Test
COTS	Commercially available Off-the-Shelf (as defined in FAR 2.101)
DSR	Designated Supplier Representative
ESD	Electrostatic Discharge
M&TE	Measuring and Test Equipment
MHP	Mandatory Hold Point
MRB	Material Review Board
PCB	Printed Circuit Board
PO	Purchase Order
PWB	Printed Wiring Board
QA	Quality Assurance
QMS	Quality Management System
QPL	Qualified Products List
RAB	Registrar Accreditation Board
SCAR	Supplier Corrective Action Request
UID	Unique Identification

## 8. Procedure for Using Clauses

### 1. Quality Clause Structure

The Quality clauses are categorized into 100, 200, and 300 series numbers. Quality Clauses shall be identified on all Production POs. When a supplier accepts the Purchase Order, they are expected to comply with all of the Quality Clause requirements listed. If a supplier cannot meet the Quality Clause requirement or feels that it is not applicable, they must contact the DRS Buyer and get the issue resolved on the Purchase Order.

**Note:** The BASE 100-series clauses are standard requirements for all DRS Sites. *Where there are site specific requirements beyond the basic Quality Clause, they are listed as subsets underneath that clause. The 200-series clauses are commodity specific. The 300-series clauses are assigned to specific item numbers, POs, contracts, or site locations.*

**Note:** *When there is a conflict between quality clauses on a purchase order, the higher number clause will take precedence (e.g., QC200-series clause takes precedence over a QC100-series clause).*

### 2. Quality Clauses

#### QC100 – Quality Management System:

The seller shall maintain a Quality Management System that complies with the requirements of AS9100, ISO 9001 or a DRS approved Quality Management System (formal certification by an accredited registrar is preferred).

The Seller shall notify the Buyer of any changes to the QMS, i.e., certification status, facility relocation, Quality Manager.

The organization shall ensure that persons doing work under the organization's control are aware of their contribution to product safety. The organization shall determine the requirements for the products and services including consideration of personal and product safety. The organization shall plan, implement, and control the processes needed to assure product safety during the entire product life cycle, as appropriate to the organization and the product. These processes include:

- assessment of hazards and management of associated risks
- management of safety critical items
- analysis and reporting of occurred events affecting safety
- communication of these events and training of persons

#### QC101 – Identification, Preservation, Packaging, and Packing:

See DRS T&C's Section 6. Unless otherwise noted on the PO, packaging and packing of all products shall be in accordance with Standard Commercial Packaging Practice. Reference ASTM D3951 – Standard Practice for Commercial Packaging (latest revision) for guidance. Additionally, suppliers are required to use tamper-evident packaging (e.g., supplier branded tape). Each packing list shall include, as a minimum, the following information:

- Part number and revision
- PO number
- PO Line item

- Quantity
- Supplier/Manufacturer's identification

**QC101.1 – Identification, Preservation, Packaging, and Packing Fitchburg, MA:**

Shipping Information: All incoming shipments must have a clearly marked packing list affixed to the outside of the package which contains the above information.

**For Domestic Shipments:**

- For parts/product that weigh 150 pounds or less, and are within all other necessary requirements, please use the following shipping methods:
  - UPS GRND - UPS Ground shipments, under 150 lbs. - Acct#: 0479AW
  - UPS RED - UPS Next Day Air Freight Acct#: 0479AW
- For all parts/products that are over 150 pounds and /or cannot be shipped via UPS Parcel due to dimensions, please contact Freight quote\* - Call or email your order info to:
  - Call toll free - 844.646.0003
  - Send an email to: [drsorders@freightquote.com](mailto:drsorders@freightquote.com)
- For any escalations, you can reach out directly to:
  - Daniel Dasari - [daniel.dasari@freightquote.com](mailto:daniel.dasari@freightquote.com) - 816.949.6507
- \*When contacting Freight quote, please have this information ready:
  - Origin and Destination Zip Codes
  - Freight dimensions - L x W x H
  - Weight (including packaging and pallet)
  - Commodity (what is being shipped)
  - Be sure to specify any special instructions
  - Ship From Company Name
  - Ship From Company Address
  - Ship From Phone Number
  - Ship From Email or Fax to receive the BOL
  - Contact person at Origin
  - PO #

**For International Shipment:**

- Address to DRS-PTI, please use the following shipment method and follow the below directions:
  - FEDEX BS FEDEX International Broker Select Acct#: 10597564-3  
Utilize DRS-PTI's Federal Express Account Number 10597564-3. Choose the "Broker Select" option
- **Customs Broker:**
  - Priority One
  - 3419 Trentwood Blvd., 2<sup>nd</sup> Floor
  - Orlando, FL 32812
  - Phone (407) 855-0925 / FAX (407) 851-2180
  - Operation: 8am – 5pm
  - ATTN: Marty Darling ([Marty@priority-one.com](mailto:Marty@priority-one.com))
  - James Gunnoy
  - ([James@priority-one.com](mailto:James@priority-one.com))

- **Bill to Address:**  
 DRS Power Technology, Inc.  
 166 Boulder Drive, Suite 20  
 Fitchburg, MA 01420  
 E-mail: [ap@drs-pt.com](mailto:ap@drs-pt.com)  
 For any Accounts Payable questions, please call 978-353-5148.
- **Ship to Address:**  
 Shipping & Receiving, Door 3, Building 2  
 DRS Power Technology, Inc.  
 166 Boulder Drive, Suite 201  
 Fitchburg, MA 01420

#### **QC101.2 – Identification, Preservation, Packaging, and Packing – St. Louis, MO:**

- **MANUFACTURER'S CAGE CODE MARKING**
  - When drawings specify part marking per MIL-STD-130 with a MFR cage code but do not specify whose code is to be used, the MFR cage code shall be the Seller's cage code unless otherwise specified in the Purchase Order.
- **WIRE IDENTIFICATION REQUIRED**
  - Seller must identify each package or spool of wire permanently and legibly with
    - DRS SSI's Purchase Order Number
    - Gauge
    - Military Specification, or
    - DRS SSI's Specification Number (if applicable)
- **DELIVERABLE**
  - Supplier must identify each package or spool with Purchase Order Number, Gauge, Military Specification/DRS SSI's Specification Number

#### **QC101.3 – Identification, Preservation, Packaging, and Packing – Milwaukee, WI; Dallas, TX; Melbourne, FL; Huntsville, AL:**

- **PACKING SLIP INFORMATION**
  - Packing slips must contain the following information:
    - Packing slip number
    - Part number\*
    - Part number revision (if applicable)
    - PO Number\*
    - PO Line Number\*
    - Quantity Shipped\*
    - Buyer Name
  - Items identified by an asterisk (\*) will also contain 23 matrix or linear code 39 barcode.
- **SUPPLIER CONTAINER LABEL**
  - External packaging for all shipped materials will be labeled as follows: Supplier Container Label: 4" W x 6" H
  - Left and Right margins = .0625" Top and Bottom margins = .0625"















o Actual Box/Table size = 3.875" W x 5.8125" H

**\*NOTE:** These dimensions are accurate within approximately 1/16th of an inch. Barcode = Data Matrix (human readable approximately .5" high), centered in cell/box (see example) Font = Arial 12 pt.

Special characters not allowed: &, ?, #,

\*Format exceptions may be made with submittal and acceptance from DRS. Project and Task to be added when provided on DRS Purchase Order

<b>EXAMPLE LABEL</b>		(LABEL WIDTH = 4" - LABEL BOX/TABLE WIDTH = 3.875")					
LABEL HEIGHT = 6" - LABEL BOX/TABLE HEIGHT = 5.8125"		Label Item	Max Characters	Alpha/Numeric	Mandatory		
LABEL HEIGHT = 6" - LABEL BOX/TABLE HEIGHT = 5.8125"	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b>PO NUMBER:</b> 113230                        113230                      (2.585 x 1.1)                 </td> <td style="width: 50%; vertical-align: top;"> <b>PO LINE:</b> 1                        1                      (1.29 x 1.1)                 </td> </tr> </table>	<b>PO NUMBER:</b> 113230  113230 (2.585 x 1.1)	<b>PO LINE:</b> 1  1 (1.29 x 1.1)	PO Number	12 char	Numeric	Yes
	<b>PO NUMBER:</b> 113230  113230 (2.585 x 1.1)	<b>PO LINE:</b> 1  1 (1.29 x 1.1)					
		PO Line	5 char	Numeric	Yes		
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b>ITEM NUMBER:</b> GCF-156200-003                        GCF-156200-003                      (2.906 x 1.1)                 </td> <td style="width: 50%; vertical-align: top;"> <b>QTY:</b> 10                        10                      (.969 x 1.1)                 </td> </tr> </table>	<b>ITEM NUMBER:</b> GCF-156200-003  GCF-156200-003 (2.906 x 1.1)	<b>QTY:</b> 10  10 (.969 x 1.1)	Item Number	27 char	Alpha/Numeric	Yes
	<b>ITEM NUMBER:</b> GCF-156200-003  GCF-156200-003 (2.906 x 1.1)	<b>QTY:</b> 10  10 (.969 x 1.1)					
		QTY	11 char	Numeric	Yes		
	<b>DESCRIPTION:</b> ENDCAPS, FOAM, 2# CHARCOAL URETHANE DIE CUT (SETS) (3.875 x 1.1)	Description	40 char	Alpha/Numeric	Yes		
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b>PROJECT:</b>                      100101                      (2.585 x 1.1)                 </td> <td style="width: 50%; vertical-align: top;"> <b>TASK:</b>                      99                      (1.29 x 1.1)                 </td> </tr> </table>	<b>PROJECT:</b> 100101 (2.585 x 1.1)	<b>TASK:</b> 99 (1.29 x 1.1)	Project	25 char	Alpha/Numeric	If listed in PO
	<b>PROJECT:</b> 100101 (2.585 x 1.1)	<b>TASK:</b> 99 (1.29 x 1.1)					
		Task	10 char	Alpha/Numeric	If listed in PO		
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b>SHIP TO:</b>                      DRS TECHNOLOGIES                      100 NORTH BABCOCK STREET                      MELBOURNE, FLORIDA                      32935                      (1.9375 x 1.4125)                 </td> <td style="width: 50%; vertical-align: top;"> <b>SUPPLIER:</b>                      ABCDEF CORPORATION                      645 ANCHORS STREET                      FT. WALTON BEACH, FLORIDA                      32548                      (1.9375 x 1.4125)                 </td> </tr> </table>	<b>SHIP TO:</b> DRS TECHNOLOGIES 100 NORTH BABCOCK STREET MELBOURNE, FLORIDA 32935 (1.9375 x 1.4125)	<b>SUPPLIER:</b> ABCDEF CORPORATION 645 ANCHORS STREET FT. WALTON BEACH, FLORIDA 32548 (1.9375 x 1.4125)	Ship To	80 char	Alpha/Numeric	Yes
	<b>SHIP TO:</b> DRS TECHNOLOGIES 100 NORTH BABCOCK STREET MELBOURNE, FLORIDA 32935 (1.9375 x 1.4125)	<b>SUPPLIER:</b> ABCDEF CORPORATION 645 ANCHORS STREET FT. WALTON BEACH, FLORIDA 32548 (1.9375 x 1.4125)					
	Supplier	80 char	Alpha/Numeric	Yes			

**QC101.4 – Identification, Preservation, Packaging, and Packing - Daylight Solutions**

See DRS T&C's Section 6. Unless otherwise noted on the PO, packaging and packing of all products shall be in accordance with Standard Commercial Packaging Practice. Reference ASTM D3951 – Standard Practice for Commercial Packaging (latest revision) for guidance. Each packing list shall include, as a minimum, the following information:

- Part number and revision
- PO number
- PO Line item
- Quantity
- Supplier/Manufacturer's identification.

**QC102 – Source of Supply:**

See Leonardo DRS General Purchase Order Terms and Conditions Section 11 for additional requirements regarding Counterfeit Electronic Parts.

Suppliers are responsible for ensuring compliance of materials used to manufacture parts supplied to DRS.

Suppliers shall only purchase materials from Original Equipment Manufacturers (OEMs), Original Component Manufacturers (OCMs) or the OEM/OCM Authorized Distributors (i.e., all electrical, electronic, and electromechanical (EEE) parts that are currently in production or available in stock at an Authorized Source, shall be procured from an Authorized Source). Purchasing from Independent Distributors (i.e., Brokers) or other sources is not authorized unless the part is no longer in production.

and is not available in stock at an Authorized Source. In this case, the Supplier shall submit a Supplier Variation Request (SVR) to document that a non-Authorized Source is being considered, and to determine the required course of action.

Approved Suppliers of electrical, electronic, and electromechanical (EEE) parts or assemblies containing EEE parts shall have an established Counterfeit Parts Control Plan in compliance with a recognized industry standard (e.g., SAE AS5553C, SAE AS6496, SAE AS6081, etc.)

All Authorized Distributors of EEE parts shall comply with SAE AS6496, Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition – Authorized/Franchised Distributors. An Authorized Distributor shall disclose to DRS, prior to shipment to DRS, if they are not authorized by the OCM/OEM to supply the EEE parts or assemblies containing the EEE parts.

All Independent Distributors (Brokers) of EEE parts shall comply with the QMS portions of SAE AS6081, Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition – Distributors. Inspection and testing requirements contained within SAE AS6081 have been superseded by SAE AS6171A, Test Methods Standard; General Requirements, Suspect/Counterfeit, Electrical, Electronic, and Electromechanical Parts, including all applicable slash sheets.

The Counterfeit Parts Control Plan of Independent Distributors (Brokers) shall be made available for review by DRS upon request, and such plans can be shared with the DRS customer and/or government agencies requesting such.

Any exceptions to the requirements of SAE AS6081 shall be made known to DRS, along with written justification for the exception.

Distributors of electronic components shall certify that franchise agreements and/or written OEM/OCM reseller authorization is on file for all parts provided.

Supplier shall notify DRS when suspect counterfeit parts have been identified (reference QC110). Notification of counterfeit or suspect counterfeit parts shall be performed using the DRS SVR process. The Supplier shall not deliver products that contain counterfeit parts, such as, but not limited to, software, material, and electrical/electronic/mechanical parts/assemblies. Any suspect or confirmed counterfeit parts delivered to DRS are considered non-conforming material and shall be controlled per site requirements. Counterfeit parts shall not be returned to the Supplier and shall be reported to GIDEP.

#### **QC103 – Measuring & Test Equipment:**

It is the seller's responsibility to ensure all equipment; including Customer Furnished Equipment (CFE), and Government Furnished Equipment (GFE), used to test and inspect DRS supplied parts are maintained and traceable to the National Institute of Standards and Technology (NIST) requirements. The calibration system used by the supplier must be in accordance with ISO 17025, General Requirements for the Competence of Testing and Calibration Laboratories and Z540.1, Requirements for the Calibration of Measuring and Test Equipment. Additionally, the supplier shall demonstrate compliance to ISO 10012 Measurement Management Systems – Requirements for Measurement Processes and Measuring Test Equipment.

**Note:** This requirement does not apply to franchised distributors of Original Component Manufacturers (OCM) selling unmodified commercial of the shelf components (e.g., capacitors, resistors, transistors etc. purchased to an OCM data sheet).

#### **QC104 – Control of Manufacturing, Testing, and Inspection Records:**

All records related to the manufacturing, testing and inspection of parts supplied to a DRS PO shall be maintained for a minimum of seven (7) years from delivery and final payment, unless otherwise specified by the individual DRS Company. These records shall be accessible, upon request, to DRS, DRS customers, or to regulatory and statutory authorities. All records submitted are subject to DRS review and approval prior to acceptance.

The Supplier must notify the Buyer before the destruction of quality records.

All blank lines on records shall be marked as N/A if not applicable. Corrections shall be made by drawing a single line through the incorrect entry, and the change must be initialed and dated. When additional information is added it shall be initialed and dated. The use of ditto marks and continuation arrows are not acceptable for repeated data, initials, or signatures.

**QC104.1 – Control of Manufacturing, Testing, and Inspection Records – Fitchburg, MA:**

Seller must maintain all records applicable to the order for a minimum of 10 years after order completion. Records must be readily identifiable and retrievable.

For commercial orders, seller must maintain all records applicable to the order for a minimum of 5 years after order completion. Records must be readily identifiable and retrievable.

**QC104.2 – Control of Manufacturing, Testing, and Inspection Records (Modified):**

All records related to the manufacturing, testing and inspection of parts supplied to a DRS PO will be maintained for a minimum of seven (7) years from delivery and final payment, unless otherwise specified by the individual DRS Company. These records shall be accessible, upon request, to DRS, DRS customers, or to regulatory and statutory authorities. All records submitted are subject to DRS review and approval prior to acceptance.

This requirement does not apply to franchised distributors of Original Component Manufacturers (OCM) selling unmodified commercial of the shelf components (e.g., capacitors, resistors, transistors etc. purchased to an OCM data sheet). However, franchised distributors of COTS components are responsible for maintaining the quality records regarding the traceability of product back to the OCM as well as the records related to their response to the DRS purchase order.

**QC105 – Supplier Material Review Board (MRB) Authority:**

The Supplier does not have MRB authority to accept or repair nonconforming products relating to Buyer controlled drawings or specifications. Any nonconformance on such final deliverable product to the purchase order, buyer drawings, buyer specifications or applicable documents must be submitted to DRS for approval prior to usage or shipment, unless otherwise documented on the Buyer’s Purchase Order.

**QC106 – Shelf Life:**

No materials will be shipped to DRS with less than 80% of the full shelf-life as determined by the original manufacturer unless previously approved in writing by DRS. The expiration dates shall be clearly recorded on the packaging and shipping documents.

As a minimum, the material or documentation shall contain the following information:

Part Number_____	Part Name_____
Manufacture Name_____	Unit of Measure_____
Lot/Batch Number_____	Shelf-Life Exp. Date_____
Manufacture Date_____	

**QC107 – Temperature Sensitive Material:**

The Supplier must identify each shipment of temperature sensitive material with the manufacture date, storage temperature and recommended shelf life. In addition to the normal identification requirements of name, type, size, lot/date code, and quantity identification, special handling conditions also must be recorded on the shipping document.

**QC110 – Notification of Non-conformances Responsibility:**

The Supplier shall inform DRS immediately when there is a reason to suspect that products previously supplied to DRS may not be in accordance with the DRS drawing(s), specification, or purchase order requirements. The Supplier shall promptly inform DRS of any circumstance related to materials, manufacturing, processing, methods, design, etc. which may make a product susceptible to premature failure or otherwise place the safe operation of that product at risk. The notification shall describe the nature of the discovered anomaly, its applicability to DRS part number(s), quantities affected and the probable impact to the proper function/performance of the item supplied.

Supplier is responsible to notify DRS if they have received any corrective actions from the government or regulatory agencies within 30 days.

**QC110.1 – Notification of Non-conformances Responsibility – Daylight Solutions:**

The Supplier shall inform DRS immediately when there is a reason to suspect that products previously supplied to DRS may not be in accordance with the DRS drawing(s), specification, or purchase order requirements. The Supplier shall promptly inform DRS of any circumstance related to materials, manufacturing, processing, methods, design, etc. which may make a product susceptible to premature failure or otherwise place the safe operation of that product at risk. The notification shall describe the nature of the discovered anomaly, its applicability to DRS part number(s), quantities affected and the probable impact to the proper function/performance of the item supplied. Supplier is responsible to notify DRS if they have received any corrective actions from the government or regulatory agencies within 30 days if it has a direct bearing on form, fit, function or delivery schedule to DRS/Daylight Solutions.

**QC111 – Control of Lower-Tier Suppliers:**

Supplier is responsible for the quality of all sub-tier products. The Supplier shall flow-down all applicable DRS purchase order requirements, including, but not limited to Terms and Conditions Federal Acquisition Regulations (FAR), Defense Federal Acquisition Regulations Supplements (DFARSs), and Quality Clauses to sub-tiers performing work involving this purchase order.

**QC111.1 – Control of Lower-Tier Supplier - Fitchburg:**

Supplier is responsible for the quality of all sub-tier products. The Supplier shall flow-down all applicable DRS purchase order requirements, including, but not limited to Terms and Conditions Federal Acquisition Regulations (FAR), Defense Federal Acquisition Regulations Supplements (DFARSs), and Quality Clauses to sub-tiers performing work involving this purchase order.

The supplier must notify DRS-PTI in writing of their intention to use sub-tier suppliers for any processes that are considered "Special Processes". DRS-PTI reserves the right to participate in the evaluation and qualification of the special process sub-tier supplier(s) and to inspect at the source any product or services not manufactured or performed within the primary supplier's facility. The election to participate in these activities will be made by DRS-PTI Supplier Quality and/or Quality Assurance.

**QC111.2 – Control of Lower-Tier Supplier - Danbury:**

Seller is responsible for the quality of all products supplied by sub-tier suppliers. The Seller shall flow-down all applicable NPS purchase order requirements

(including, but not limited to, Terms and Conditions, Federal Acquisition Regulations (FAR), Defense Federal Acquisition Regulation Supplements (DFARS), and Quality Clauses), to sub-tier suppliers performing work involving this purchase order.

The following quality clauses, at a minimum, are required to be flowed down to sub-tier suppliers, if they are included on the PO line item that the sub-tier supplier is performing work on:

- QC102 – Source of Supply
- QC103 – Measuring & Test Equipment
- QC104 – Control of Manufacturing, Testing, and Inspection Records
- QC105 – Supplier Material Review Board (MRB) Authority
- QC114.1 – Parts Substitution
- QC116 – Right of Access
- QC117 – Mercury Prohibition
- QC117.1 – Prohibited Materials
- QC118 – Government, DRS or Customer Property
- QC122 – Notification of Changes
- Any QC200 or QC300 series clauses that apply to the work being done by the sub-tier supplier

The Seller shall obtain NPS approval via Supplier Variation/Approval Request (form SEP-00-06- F01-CCI) to use sub-tier suppliers for any processes that are considered Special Processes. These include the following:

- Welding
- Brazing
- Machining
- Soldering
- Conformal Coating
- Crimping
- Finishing (plating, heat-treating, passivation, coating, priming, painting, etc.)
- Non-destructive testing

NPS reserves the right to participate in the evaluation and qualification of the special process sub-tier supplier(s) and to inspect at the source any product or services not manufactured or performed within the primary supplier's facility.

#### **QC112 – Supplier Corrective Action Request:**

A Supplier Corrective Action Request (SCAR) shall be forwarded by DRS to a Supplier when corrective action is required. Upon notification of the nonconformance, the supplier shall take immediate containment action. The supplier shall complete the analysis of cause and propose corrective action within ten (10) calendar days or within the due date assigned to the SCAR. Failure to respond in a timely manner may result in the removal of the Supplier from the Approved Suppliers List. Upon notification of the nonconformance, shipments may be suspended until containment processes are enacted.

**QC113 – Certificate of Compliance, or Conformance (C of C):**

Supplier shall submit with each shipment either on their packing list, or attachments, a certificate of conformance or certificate of compliance, which shall be dated and bear the signature and title of an authorized Suppliers Quality Representative, stating that the materials and services furnished to DRS are in conformance with the applicable requirements of the contract, drawings, and specifications. It shall also state that the supporting documentation is on file and will be made available to DRS, its customer(s), Government Representative, or any other regulatory or statutory agency upon request, unless it forms part of the drawings'/specifications' data requirements in which case the supporting documentation (including test results) will be shipped with the product. Certification must include the following:

- The supplier's full name and address; (Distributors should list OEM)
- DRS purchase order number
- DRS part number, revision, and as applicable, serial numbers
- PO quantity
- Quantity shipped
- Lot / Date Code
- Name of lower-tier supplier and description of service provided (if applicable) ref QC 210
- Authorized signature and date
- Certificate or C of C by the supplier declaring the product or service has met all the requirements of the purchase order, including drawings and specifications at the prescribed revision level.

An example of an acceptable statement of Certificate of compliance/conformance is as follows: "This is to certify that all items noted are in conformance with the contract, drawings, specifications, and other applicable documentation, and that all process certifications, chemical and physical test reports are on file at this facility and are available for review by Leonardo DRS".

Suppliers shall maintain certifications (CofC's) from all sub-tier suppliers/processors/OEMs/OCMs. Unless specifically required per purchased order, the Supplier's lower-tier supplier/processor C of Cs shall be made available to DRS, DRS customer(s), authorized Government Representative, or any other regulatory or statutory agency upon request.

**Qualified Products List (QPL):** One or more of the items of this order may be identified as a QPL part that is required to be produced by a Qualified Product Listed (QPL) supplier. Your certifications must contain evidence of manufacture by a QPL source.

**Note:** This requirement does not directly apply to franchised distributors of Original Component Manufacturers (OCM) selling unmodified commercial of the shelf components (e.g., capacitors, resistors, transistors etc. purchased to an OCM data sheet).

However, the franchised distributor is still responsible for selling authentic product for which they are franchised as well as maintaining the quality records related to product traceability back to the OCM.

**QC113.1 – Certificate of Compliance / Conformance (C of C) – Naval Power Systems:**

Supplier shall submit with each shipment a Certificate of Compliance / Conformance on supplier letterhead, indicating that the materials furnished to DRS are in conformance with the applicable requirements of the contract (e.g., Ts & Cs, PO comments, Quality Clauses, etc.), drawings, and specifications (e.g., procedures, material certifications, etc.).

A Certificate of Compliance / Conformance (C of C) is required for EACH unique PO part number and must include the following:

1. The supplier's full name and address
2. Manufacturer's full name and manufacturing address if different than seller (Distributors only need to list OEM/OCM full name)
3. DRS purchase order number
4. DRS part number, revision, and as applicable, serial numbers (Distributors only need to list DRS part number.)
5. Seller or Manufacturer's part number, revision, and as applicable, serial numbers (if different than DRS part number, revision, and serial numbers and only if the Seller or Manufacturer's part number is specifically identified on the drawing)
6. Quantity shipped (**Note:** C of C is applicable to this quantity only for partial shipments and subsequent shipments require a unique C of C for the balance)
7. Date codes or lot codes, as applicable
8. Statement by the supplier declaring the product or service has met all the requirements of the purchase order
9. Supplier's authorized personnel signature, printed name, title, and date (Distributors only need name (in any format) and date)

**Note:** Statements on certification documents must be positive and unqualified. Words such as "To the best of our knowledge" or "We believe the information contained herein is true" are not acceptable.

An example of an acceptable statement of compliance / conformance is as follows:  
*"This is to certify that all items noted are in conformance with the contract, drawings, specifications, and other applicable documentation, and that all process certifications, chemical and physical test reports are on file at this facility and are available for review by Leonardo DRS".*

Unless specifically required per the purchase order, the Supplier's lower-tier supplier/processor C of Cs shall be made available to DRS, DRS customer(s), authorized Government Representative, or any other regulatory or statutory agency upon request.

Distributors shall include the OEM Certs.

**COTS Suppliers:** The packing slip, provided all packing slip requirements are followed, can be used in lieu of a C of C.

**Qualified Products List (QPL):** One or more of the items of this order may be identified as a QPL part that is required to be produced by a supplier on the Qualified Products List (QPL). In these cases, the supplier certifications must contain evidence of manufacture by a QPL source.



**QC114 – Parts Substitution:**

The Seller shall not deliver substitute parts for the part specified on the purchase order line unless DRS and/or DRS customers have approved the substitution in writing as evidenced by a formally released DRS alternate parts document, other document or instruction. For Buyer specified and controlled drawings and specifications, the Seller shall not use substitute or alternate component parts or subassemblies without receiving approval in writing. The supplier shall notify DRS of any End of Life, Obsolescence or Form, Fit, or Function issues for ten (10) years beyond the award date of the purchase order.

**QC114.1 – Parts Substitution Less Packaging:**

The Seller shall not deliver substitute parts for the part(s) specified on the purchase order line unless DRS and/or DRS customers have approved the substitution in writing as evidenced by a formally released DRS alternate parts document, other document or instruction. For Buyer-specified and controlled drawings and specifications, the Seller shall not use substitute or alternate component parts or subassemblies without receiving approval in writing. The supplier shall notify DRS of any End of Life, Obsolescence or Form, Fit, or Function issues prior to fulfillment of the purchase order. One exception to the requirement above is for packaging of electrical components. Any packaging configuration is acceptable to DRS. Examples (not all inclusive) include:

- Bulk
- Cut Tape
- Tape & Reel
- Tray

Example: For the KOA Speer Electronics 100k resistor, the part number is: RK73H1FTTX1003D. The packaging information is identified by the TX. Acceptable alternatives can have any packaging designation in place of the TX.

**QC115 – Safety Data Sheet (SDS):**

Operational Safety and Health Administration (OSHA) Global Harmonized System (GHS) (formerly MSDS and label requirements): Each purchased product shipment shall contain appropriate hazard and precautionary information using Safety Data Sheets (formerly MSDS), and labels shall be in accordance with GHS requirements.

**QC116 – Right of Access:**

During the performance of the order, DRS, DRS Customers, and/or a regulatory or statutory agency including Government Representatives, reserve the right to attend, review, and participate in the Supplier's Quality System and associated manufacturing processes including inspection and testing of any work related to this contract. DRS, DRS Customers, and/or regulatory or statutory authorities shall be afforded the right to verify at the supplier's premises (or Supplier's subcontracting premises) that the supplier's product conforms to all specified requirements.

**QC117 – Mercury Prohibition:**

The supplies furnished under this Purchase Order shall not contain functional mercury. Furthermore, external contamination by metallic mercury or mercury compounds shall be cause for rejection. The Supplier shall notify DRS prior to proceeding with manufacturing or shipping if the presence of mercury or mercury contamination is suspected. The Supplier shall perform a suitable test to verify the suspicion. The

deliverable materials shall not come into direct contact with mercury containing devices employing only a single boundary of containment. A single boundary of containment is one which is not backed by a second seal or barrier to prevent contamination in the event of rupture of the primary seal or barrier. This requirement does not preclude the use of fluorescent lighting fixtures or fixtures employing mercury vapor lamps, which contain no more mercury per lumen than a comparable fluorescent lamp.

**QC117.1 – Prohibited Materials – NPS:**

Unless specifically called out by Leonardo DRS, Naval Power Systems, Inc. (NPS) procurement documents or approved drawings, the materials listed in Table 1 shall not be used in the manufacture of items delivered to NPS.

Exceptions may be made subject to the following notification, evaluation, review, and approval process.

*Where there is no suitable substitute material and performance, function, reliability, maintainability, life cycle or cost of the item would be adversely affected, the supplier shall notify NPS in writing prior to production and identify the type, location, and amount of material to be used per the SVR process. The notification shall include an evaluation of all alternatives considered.*

**Table 1: Prohibited Materials**

Adhesive Tape	Liquid masking material (for electrical connectors and socket mounted components)
Aluminum Electrical Conducting Wire	Lithium
Aluminum Alloys	Low Ductility Materials
Antimony and Alloys	Low Melting Point Metals
Asbestos	Magnesium
Barium	Mercury & Mercury Compounds (See QC117)
Bismuth and alloys	Ozone Depleting Substances
Boron Trifluoride	Polychlorinated Biphenyls (PCBs)
Brass with Pb > 1%	Polyvinyl Chloride (PVC)
Bronze with Pb > 1%	Radioactive Materials
Cast Iron and Cast Aluminum	Selenium
Cadmium and Cadmium Plating	Silicone
Chromium & Chromium Compounds (including Hexavalent Chromium)	Silver
Cork	Teflon
Corrosion Inhibitors	Thermal compound (for electrical connectors and socket mounted components)
Flammable materials	Thiosulfate
Fragile or Brittle materials	Tin and alloys
Freon solvents	Zinc, alloys and chromates
Lead and alloys	Zinc Plating, Galvanizing, Hexavalent Chromium, & Plastic Coatings.

**QC117.2 – Asbestos Prohibited Materials Warning – Milwaukee:**

**\*\* ASBESTOS WARNING \*\*ASBESTOS IS A HUMAN CARCINOGEN WHICH PRESENTS A HAZARD TO PERSONNEL HANDLING OR OTHERWISE WORKING**

WITH IT. ANY ASBESTOS OR ASBESTOS CONTAINING MATERIAL SUPPLIED ON THIS ORDER MUST BE ANNOTATED ON THE PACKING LIST AND MUST BE IDENTIFIED ACCORDINGLY WITH APPROPRIATE OSHA APPROVED LABELS OR TAGS TO INFORM ALL PERSONNEL WHO HANDLE OR WORK WITH THE MATERIAL OF THE POTENTIAL ASBESTOS HAZARD.

**QC118 – Government, DRS or Customer Property:**

(Ref. FAR Part 52, Subpart 245) When applicable, property supplied by DRS, its customer(s), and/or the Government to be incorporated into the Supplier's finished product shall be inspected upon receipt for evidence of acceptance and will be maintained throughout the manufacturing process.

**QC119 – DRS-Owned Tooling:**

All tooling created against line items called out on this purchase order are the property of DRS. DRS requires all tooling creations/revisions to be submitted to DRS for approval; unless authorized by DRS, no modifications to tooling shall be made. DRS owned tooling at Seller's facility shall be controlled by a procedure, which, as a minimum, contains identification method, storage method, maintenance, and how tooling suggested changes are controlled.

The Seller shall take all reasonable steps necessary to perform regular maintenance on tooling as required. The Seller agrees to notify the Buyer immediately upon the discovery of any loss, damage or destruction of the tooling created.

**QC120 – Foreign Object Debris (FOD) Prevention and Part Cleanliness:**

The Supplier shall conduct production processes appropriate to prevent, detect, and remove all FOD from product(s) during manufacture and provide parts clean and free of all FOD prior to shipment to DRS. FOD contamination will be cause for rejection of material.

**QC120.1 – Foreign Object Debris (FOD) Prevention and Part Cleanliness – AS9146 / NAS 412:**

The Supplier shall conduct production processes appropriate to prevent, detect, and remove all FOD from product(s) during manufacture and provide parts clean and free of all FOD prior to shipment to DRS. FOD contamination will be cause for rejection of material. Suppliers are encouraged to institute Foreign Object Damage (FOD) Prevention Programs using AS 9146, "Foreign Object Damage (FOD) Prevention Program – Requirements for Aviation, Space, and Defense Organizations" or NAS 412, "Foreign Object Damage / Foreign Object Debris (FOD) Prevention" as a guideline.

**QC121 – First Article Inspection:**

The Seller shall perform a First Article Inspection (FAI) on Buyer controlled drawings and specifications in accordance with AS9102 latest revision or a DRS approved First Article Inspection Process, if one of the following conditions apply:

- First time submission (part or new supplier)
- Revision change affecting form, fit, or function
- A process change used to manufacture the part
- Change in manufacturing location (facility)

- 24 months or longer have passed since the supplier has last produced part
- A special request by DRS and called out separately on the PO

Subassemblies and/or detail parts where the seller has design authority shall have FAI requirements as defined on the statement of work or purchase order.

If the purchase order line item specifies a buyer or seller designed product that has standard catalog commercial-off-the shelf hardware included at the subassembly levels, FAI is NOT required for the standard catalog or Commercial-Off-The-Shelf (COTS) parts/assemblies. All first article inspections performed by the seller will be accompanied with a First Article Inspection Report (FAIR) and all other approved documentation showing conformance to the contract, purchase order, drawing, or performance requirements specified by DRS.

**Note:** *This clause does not apply to purchase order lines that specify COTS Items.*

#### **QC122 – Notification of Changes:**

The seller shall provide written notification to the buyer prior to manufacturing of any changes from the following list:

- Quality Management System
- Quality Management Personnel
- Ownership and Executive Management
- Manufacturing locations

The item(s) described on buyer drawing is the only configuration approved by DRS. Any changes to these requirements require approval prior to manufacturing.

After a First Article has been received and approved by DRS, any of these changes require DRS approval prior to making the changes:

- Manufacturing locations
- Changes in key suppliers
- Machines and Equipment changes
- Process changes
- Any other changes that could affect form, fit, or function. If the supplier is not sure of the effect, then approval shall be requested.

This includes but is not limited to supplier owned design items where design is created from buyer's specifications. The supplier is responsible to communicate this requirement to any and all sub-tiers. To submit change requests, contact your DRS buyer. Suppliers are encouraged to submit change requests to improve quality, reliability, and process capability, as well as reducing costs and lead- times.

A documented request for change shall be submitted to the Buyer 30 days prior to plan implementation.

**Note:** This requirement does not apply to franchised distributors of Original Component Manufacturers (OCM) selling unmodified commercial off the shelf components (e.g., capacitors, resistors, transistors etc. purchased to an OCM data sheet).

#### **QC123 – Rejection of product using Sample Inspections:**

DRS reserves the right to reject an entire lot if any defects are detected at DRS.

**QC124 – Drop-shipped Parts and Material:**

When the seller is requested by DRS to drop-ship parts or material to a location other than DRS, they will include a copy of the purchase order along with all required data and certifications specified by the purchase order's Quality Assurance Codes (QAC's / QC's). The seller will also send electronic copies of the packing slip and tracking information to the DRS buyer at the time of shipment. The seller will ensure source inspection is performed or a waiver for such inspection is received from DRS Quality prior to shipment if the purchase order contains a Quality Condition requiring source inspection.

The receiving organization of drop-shipped material will notify the buyer when parts and materials are received. The receiver will also verify the appropriate type and quantity of materials and ensure such materials are undamaged by handling and shipping. The receiver will immediately notify the DRS buyer of any problems or concerns with received materials.

**QC2XX Series Quality Clauses**

These quality clauses pertain to commodity groups and may be assigned to an item based upon its commodity.

**QC201 – Solderability:**

All parts that require soldering shall meet industry standards for hand and machine soldering. The supplier shall ensure compliance to IPC/EIA J-STD-002 Solderability Tests for Component Leads, Terminations, Lugs, Terminals and wires. Components that require tinning shall be tested and certified to IPC/EIA J-STD-002 Section 4.3.1 Test "E" Wetting Balance Test (Leaded Components); Section 4.3.2 Test "F" Wetting Balance Test (Leadless Components); and IPC/EIA J-STD-013 Implementation of Ball Grid Array and Other High Density Technology Outlines for Ball Grid Arrays.

**Note:** This requirement does not apply to franchised distributors of Original Component Manufacturers (OCM) selling unmodified commercial of the shelf components (e.g., capacitors, resistors, transistors etc. purchased to an OCM data sheet).

However, franchised distributors shall ensure that adequate packaging in keeping with manufacturer and industry standards protects the OCM's parts and their solderability (e.g., Electrostatic Discharge Control and Moisture Sensitive Device packaging controls).

**QC202 – Electrostatic Discharge (ESD) Control:**

All electrostatic sensitive devices shall be packaged, marked, and handled in compliance with ANSI/ESD S20.20 Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices), or equivalent.

**QC202.1 – Printed Wiring Assembly (PWA) ESD Packaging External Marking (Milwaukee):**

PWAs shall include a 2"x4" (or larger) label affixed to the ESD packaging with the following information:

- DRS part number (with QR code containing part number)
- Part revision
- Part serial number (with QR code containing serial number)

**QC203 – Printed Wiring Boards (PWBs):**

PWBs will comply with IPC-A-600 Acceptability of Printed Boards unless otherwise specified. Unless otherwise specified on the PO or drawing must meet J-STD-003 Solderability Test for PCBs.

**Note:** The supplier will default to IPC Class 3 requirements if the class is not otherwise specified on the PO or other DRS supplied documentation.

**Note:** This clause does not apply to COTS Items.

**QC203.1 – Printed Wiring Boards (PWBs): Rigid & Flex PWBs:**

The Seller shall furnish with each shipment of Rigid and Flexible Type 2 and 3 printed wiring, a certification that the applicable specifications as stated on the drawing or in the Purchase Order are met. Seller shall furnish (1) each of the following:

- coupon for each panel processed per part number,
- cross-sectioned mount per part number showing the plated through hole
- cross-sectioned mount after the Thermal Stress Test. The cross section shall represent “x and “y” directions of the panel, i.e., one cut in the “x” direction and one in the “y” direction.

All deliverables shall include traceability to date code/lot/serial number of the PWB manufactured. Boards to be individually bagged, but NOT HEAT SEALED.

**Deliverable:** *Seller's written certification to applicable specification as stated on the drawing or Purchase Order, and applicable coupons*

**QC203.2 – Printed Wiring Boards (PWBs) Alternatively Detailed Special Requirements:**

PWBs shall be fabricated and tested in accordance with the applicable drawing. Solderability testing shall be in accordance with J-STD-003 Solderability Tests for Printed Boards. 100% Net List Testing is to be performed on all lots.

PWBs shall be rejected if not all of the following are provided:

- One coupon per panel is to be maintained by the supplier. (Reference QC104.)
- Individual PWBs, and its associated coupon, shall be marked or not marked with a serial number traceable to the production panel which shall be marked with its own serial or production lot number as defined in the individual PWB drawing.
- A copy of the lot inspection and acceptance data.
- A micro section report with the plated through hole copper thickness recorded for each inspection lot.
- A serial number list showing the final disposition of all PWBs/panels in the production lot.
- PWBs shipped to DRS must be packaged with desiccant and a moisture indicator in Moisture Barrier Bags.
- Date codes on PWBs must not exceed 365 days before the date of shipment to DRS.

**Note:** *PWBs with date codes exceeding 365 days may be shipped to DRS with prior written approval. If the PWBs pass Solderability testing, the boards will be accepted.*

**Note:** *This clause does not apply to COTS Items.*

**QC204 – Circuit Card Assemblies (CCAs):**

CCAs will comply with IPC-A-610 Acceptability of Electronic Assemblies unless otherwise specified. CCAs will comply with IPC-J-STD-001 Requirements for Soldered Electrical and Electronic assemblies unless otherwise specified.

**Note:** The supplier will default to Class 3 requirements if the class is not otherwise specified on the PO or other DRS supplied documents.

**Note:** *This clause does not apply to COTS Items.*

**QC204.1 – Circuit Card Assemblies (CCAs) - Quality Procurement Requirements for Danbury, CT:**

DRS document QPR\_CCA (Quality Procurement Requirements for Circuit Card Assemblies) applies to all non-commercial nuclear material on this PO line item. DRS document QPR\_NO. CNCCA-001 (Quality Procurement Requirements for Commercial Nuclear Circuit Card Assemblies) applies to all commercial nuclear material on this PO line item. The required revision is the revision with a release date that is equal to or most closely precedes the date of this purchase order. Contact your DRS Buyer for a copy of the documents.

**QC205 – Wiring Harnesses:**

Cables and wiring harnesses will comply with IPC/WHMA-A-620 Requirements and Acceptance for cable/Wire Harness Assemblies unless otherwise specified. Cables and wiring harnesses must be 100% electrically tested per IPC/WHMA-A-620. Unless otherwise prohibited by the cable assembly drawing, fill all unused connector contact locations with contacts supplied with the connector. All unused grommet holes to be filled with contacts or sealing plugs specified in the parts list.

**Note:** *The supplier will default to Class 3 requirements if the class is not otherwise specified on the PO or other DRS supplied documents.*

**Note:** *This clause does not apply to COTS Items*

**QC206 – Rework/Repair Authorization of Circuit Card Assemblies:**

Rework shall be in accordance with IPC-7711/7721 Rework, Modification and Repair of Electronic Assemblies. Repair shall be in accordance with IPC-7711/7721 Rework, Modification and Repair of Electronic Assemblies, only after approval by DRS.

**QC207 – Moisture Sensitive Components:**

The supplier shall ensure packaging and handling of all moisture sensitive components, as classified by, and in accordance with IPC/JEDEC J-STD-033 Standard for Handling, Packing, Shipping, and Use of Moisture/Re-flow Sensitive Surface Mount Devices and IPC/JEDC J-STD-020 Moisture/Reflow Sensitivity Classification for Non-hermetic Solid State Surface Mount Devices, or other documented procedure.

**QC207.1 – Moisture Sensitive Components - St Louis (SSI) Requirements:**

DRS SSI IN-PROCESS INSPECTION REQUIRED (HERMETICALLY SEALED ITEMS) Items covered by Purchase Order require in-process inspection by DRS SSI's Quality Field Representative prior to the hermetic sealing of any permanent or difficult to disassemble enclosure. The Seller must notify Source Scheduling Service ten (10)

days prior to required inspection coverage. Contact DRS SSI's Source Scheduling Service at e-mail address [SSIsqastl@drs.com](mailto:SSIsqastl@drs.com)

Deliverable: Conformance noted on AEC by DRS SSI Field Quality Representative.

**QC208 – Magnetic Core Packaging Requirement:**

Magnetic Cores shall be bagged/boxed in a manner to prevent contact with each other.

**QC208.1 – Magnetic Core Packaging – Fitchburg:**

The Seller shall include the magnet properties data with the shipment of the magnets. Seller shall ship magnets to DRS Power Technology, Inc. in individual packaging. Many of these individually packaged magnets can be contained within one container. Each shipping container shall have shunt material on all six sides to shield the magnets' flux from anything magnetic (or magnetically susceptible), that is external to the container.

**QC209 – NDT Requirements for Die Castings:**

Die casting must meet the X-ray requirements per ASTM E505 radiographs Ref. standards categories A, B, C, and D. Die casting must be penetrant inspected per ASTM E1417 type 1 method A. Cracks, hot tears, cold shuts, and thru wall voids / porosity are not allowed and will be cause for further investigation up to and including rejection. Die castings shall be selected in accordance with table 1 (sampling plan) of AMS 2175. Requirement applies after all machining operations are completed. Requirements take precedence over other standards should there be a conflict.

**QC210 – Special processes:**

Are defined as any processes for production and service provision where the resulting output cannot be verified by subsequent monitoring or measurement and, as a consequence, deficiencies become apparent only after the product is in use or the service has been delivered.

Process certifications are required for all special processes to be submitted to DRS with the delivered item and shall be in accordance with C of C requirements, with the additional requirement of stating the process being certified. If the special process was outsourced, the cert shall originate from the contracting company.

The Supplier shall ensure that all personnel performing special processes such as welding, soldering, plating, non-destructive testing, etc. are certified to perform the special process in accordance with the requirements of the specification, the P.O., or any specifications referenced directly or indirectly therein. The Supplier shall ensure the associated equipment used for these processes is certified as appropriate.

This flow-down is applicable to all sub-tier suppliers performing any special process.

**QC210.1 – Certification of Special Processes – DRS managed approval:**

The following special processes shall be NADCAP certified or approved by DRS prior to production; welding, solder, brazing, and any additional process called out on the face of this purchase order. Changes to any previously authorized processes require resubmittal, review and authorization. (This also applies to the following special processes if they are not performed in accordance with an industry specification or Mil-Spec; testing, painting, plating, heat-treating, and conversion & passivation).



**QC210.2 – Certification of Special Processes – Supplier managed approval:**

The Seller shall establish a system to assure that special processes will be performed in accordance with the specification requirements, in adequate facilities, by competent personnel using proper procedures. When critical or special processes are performed outside the Seller's facility, it shall be the responsibility of the Seller to assure proper performance of all such processes, through surveys, certification, testing, etc.

**QC210.3 – Certification of Special Processes – Customer managed approval:**

If drawings and/or specifications listed in this purchase order require special processes at the seller or the seller's sub-tier, these processes shall be certified by the customer prior to production. Changes to any previously authorized processes require resubmittal, review, and authorization.

**QC210.4 – Special processes – Naval Power Systems:**

Are defined as any processes for production and service provision where the resulting output cannot be verified by subsequent monitoring or measurement and, as a consequence, deficiencies become apparent only after the product is in use or the service has been delivered.

This flow-down is applicable to all sub-tier suppliers performing any special process. Approved process certifications are required for all special processes, are to be submitted to DRS with the delivered item and shall be in accordance with C of C requirements, with the additional requirement of stating the process being certified. If the special process was outsourced, the certification shall originate from the contracting company.

The Supplier shall ensure that all personnel performing special processes such as welding, soldering, plating, non-destructive testing, etc. are certified to perform the special process in accordance with the requirements of the specification, the P.O., or any specifications referenced directly or indirectly therein. The Supplier shall ensure the associated equipment used for these processes is certified as appropriate.

**Certification of Special Processes – DRS Naval Power Systems managed approval:** The following special processes shall be NADCAP certified or approved by DRS prior to production; welding, solder, brazing, any additional process called out as such on the face of the purchase order, and all associated non-destructive testing procedures. Changes to any previously authorized processes require resubmittal, review and authorization. (This also applies to the following special processes if they are not performed in accordance with an industry specification or Mil-Spec; testing, painting, plating, heat-treating, and conversion & passivation.)

**Non-Destructive Test:** All applicable Non-Destructive test procedures should be developed utilizing the NAVNDT web-based application. NAVNDT is a free application available to all DRS Naval Power System suppliers.

**Welding:** All Welding procedures should be developed utilizing the NAVWELD web-based application. NAVWELD is a free application available to all DRS Naval Power System suppliers.

The Supplier shall ensure that all special process characteristics are fully completed prior to finished good shipment to DRS (e.g., paint cure time, conformal coating, etc.)

unless authorized by a DRS PO comment. If the DRS provided drawing does not have sufficient special process information, then the supplier shall create any necessary fabrication drawing(s) based on the DRS model.

**QC211 – Fastener Quality Assurance Requirement:**

Specified items are or may contain at least Grade 5 Fasteners as defined in SAE J429. Supplier is required to maintain a Fastener Quality Assurance Program. Specific details are included with the purchase order by a Fastener Quality Assurance Program Outline. Deliverable: Fastener Quality Assurance Program, which has been approved by DRS SSI's Quality Assurance.

**QC211.1 – External Threaded Fastener Requirements (St. Louis):**

Seller must provide test report data per the following applicable sections.

1. Hex cap Screws: (Inch)
  - a. S A E J429/FF-S-85 Certification Required
  - b. Specified items are at least a Grade 5 fastener as defined in SAE J429. FF-S-85 applies in full. (Latest revision)
  - c. Head markings shall conform to SAE J429 and shall include the manufacturer's identification symbol.
2. Hex cap screws: (Metric)
  - a. S A E J1199 or ASTM F568 Certification Required. Certification to DIN or ISO equivalent acceptable. Specified items are at least property class 8.8.
3. Alloy Steel Hex Socket Cap Screws: (Inch) ANSI/ASME B18.3 Test Certification Required
4. Alloy Steel Hex Socket Cap Screws: (Metric)
  - a. ANSI/ASME B18.3 Test Certification Required. Certification to DIN or ISO equivalent acceptable.
5. Any externally threaded fastener not defined above shall be tested per requirements defined by DRS SSI's drawing and applicable specifications. These requirements are applicable to fasteners with a tensile strength of 120,000 PSI or greater.

Deliverable: Legible and reproducible copy of chemical, physical and plating reports, as required, as well as certification to the applicable requirements and purchase order.

**QC211.2 – External Threaded Fastener Requirements (DRS TCL):**

All USA specification threaded fasteners shall conform to the fastener quality act. A certificate of material analysis shall accompany each shipment. Fasteners subject to finishing shall also have a certificate of compliance (from the finisher) accompanying the shipment referencing the associated specification. Fasteners subject to heat treat also require a certificate of compliance detailing the associated specification.

**QC221.1 – First Article Inspection – AS9102 and Balloon print requirement:**

*This QC Clause supersedes QC121 with alternate methodology as described within.*

The Seller shall perform a First Article Inspection (Full or Delta FAI) on DRS and/or Customer revision-controlled drawings such as Buyer controlled drawings, Source Controlled Drawings, Vendor Developed Item Drawings and specifications in accordance with AS9102 latest revision for this purchase order if one of the following apply:

- First time submission (part or new supplier)
- Revision change affecting form, fit, or function
- A process change used to manufacture the part
- Change in manufacturing location (facility)
- 24 months or longer have passed since the supplier has last produced part
- As requested by DRS

Each FAIR package must include all the following items:

- Completed AS9102 Forms 1, 2 and 3
- Completed balloon print
- Certificate of Conformance for delivered assembly
- Certificates of Conformance for all parts and materials used in the assembly
- Full AS9102 for any sub-assemblies, including the PCB, custom hardware, cables, etc.
  - These may be flowed down to the sub-tier supplier or performed by the prime supplier.
  - All C of C's for sub components
- All test records

Delta FAIRs only require the documents related to the change to be sent.

Subassemblies and/or detail parts where the seller has design authority shall have FAI requirements as defined on the statement of work or purchase order.

#### **QC221.2 – First Article Inspection – Source Inspection Required:**

*This QC Clause supersedes QC121 with alternate methodology as described within.*

The supplier must contact DRS with 10 calendar day advance notice to witness the 1<sup>st</sup> Article Inspection. The seller shall furnish, at no charge to DRS all necessary facilities, personnel, and equipment to perform tests as required by this order.

#### **QC221.3 – First Article Inspection – Specific requirements for Danbury, CT:**

*This Quality Clause supersedes QC121 with alternate methodology as described herein.* The Seller shall perform a First Article Inspection (FAI) on Buyer-controlled drawings and specifications for this purchase order in accordance with the latest revision of AS9102 if one of the following apply:

- First time submission (new part or new supplier)
- Revision changes affecting form, fit, or function
- Change in manufacturing source(s), process(es), inspection method(s), tooling, or materials affecting form, fit, or function
- Change in manufacturing location (facility)
- A natural or man-made event, which may adversely affect the manufacturing process
- 24 months or longer have passed since the supplier has last produced the part
- As requested by DRS (purchase order supplier quality clauses are not considered requests)

- Requests will be added as a separate purchase order line item since the part may not meet any of the above criteria requiring a FAIR submittal

All First Article Inspections performed by the Seller shall be accompanied by a First Article Inspection Report (FAIR), submitted to DRS via the Net-Inspect web-based software, verifying conformance to the purchase order and drawing requirements specified by DRS. Along with completing Forms 1, 2, and 3, the following documents are required to be attached to the FAIR submission in Net-Inspect:

- Ballooned drawing
- Certificate of Conformance (ref. QC113.1)
- Component / hardware Certificate of Conformance for each item on the Bill of Materials, including COTS items
- Raw material Certificate of Conformance for all specified materials
- Finish Certificate of Conformance for all specified materials
- Special process certifications (ref. QC210)
- Process documentation used to manufacture the item
- Test and/or Inspection reports (ref. QC312 series), if applicable
- Welding inspection records, if applicable
- Approved Supplier Variation Requests (SVRs), if applicable
- Approved Supplier Approval Requests (SARs), if applicable
- Any additional documentation required by specific purchase order flow-downs

The Seller shall also weigh the completed part and record the weight as a characteristic on Form 3. This shall be done regardless of whether the weight is required by the drawing

In addition to the above requirements, First Article Inspection data for assemblies containing purchased electrical, electronic, and electromechanical (EEE) parts shall include the following (reference AS5553 for more information):

- Completed FAI for major subassemblies (e.g., Printed Wiring Board, etc.)
- C of C from the manufacturer (OCM/OEM) and/or authorized source containing the following information as required to enable traceability/tracking to the manufacturer:
  - DRS-NPS Part Number
  - Name of OCM/OEM
  - OCM/OEM Part Number
  - Name of authorized source (if not purchased directly from the OCM/OEM)
  - Purchase Order Number

The Seller shall ship the part used for the First Article Inspection to DRS to coincide with the submittal of the First Article Inspection Report in Net-Inspect. The outside of the box shall be marked to indicate it contains a first article part. No further shipments are allowed until the FAIR is approved by DRS in Net-Inspect.

#### **QC221.5 – First Article Inspection at Source – Specific requirements for St Louis, MO:**

*This QC Clause supersedes QC121 with alternate methodology as described within.*

The Seller shall perform a First Article Inspection (FAI) on Buyer controlled drawings and specifications in accordance with AS9102 latest revision for this purchase order if one of the following apply:

- First time submission (part or new supplier)

- Revision change affecting form, fit, or function
- A process change used to manufacture the part
- Change in manufacturing location (facility)
- 24 months or longer have passed since the supplier is last produced part
- As requested by DRS

All first article inspections performed by the seller will be accompanied with a First Article Inspection Report (FAIR) and all other approved documentation showing conformance to the contract, purchase order, drawing, or performance requirements specified by DRS.

**Note:** *This clause does not apply to COTS Items.*

- FAIR supplemental documents include material and processing certs, itemized (ballooned drawing) and other documents as required by Purchase Order.
- Submit source inspection request to [SSIsqastl@drs.com](mailto:SSIsqastl@drs.com) five (5) calendar days prior to source event.
- Shipment of the first production lot shall not be made until DRS SSI has notified Seller of FAIR approval.
- The FAIR documents shall be submitted by upload to the DRS FTP Transfer Folder as instructed by DRS Supply Chain.
- The Supplier shall send a notification email to DRS Supplier Quality that FAIR documents have been uploaded to the DRS FTP Transfer Folder. The Supplier shall choose the email address based on the ship-to location as shown on the PO:
  - FOR SHIP-TO DESTINATION OF WEST PLAINS, MO. (Send notification to [SSIFAIR-WP@drs.com](mailto:SSIFAIR-WP@drs.com))
  - FOR SHIP-TO DESTINATION OF ST. LOUIS, MO. (Send notification to [SSIFAIR-STL@drs.com](mailto:SSIFAIR-STL@drs.com))

Following initial review of the FAIR, DRS SSI will verify the FAIR at the Seller's facility by actual measurements of the First Article part/item/unit, witnessing of applicable Acceptance Test Procedures and an in-process audit of the Seller's production processes and process controls.

The Seller must perform the First Article Inspection at the assembly and detail parts level. The use of sub-tier supplier, receiving inspection, in process and final inspection data may be acceptable. DRS SSI reserves the right to disassemble the First Article if necessary to verify all drawing requirements.

If representative subassemblies or detailed components are available from other work in process, disassembly of the First Article may not be required. The parts used to satisfy the First Article Inspection requirement must be available to DRS SSI and must be traceable to Seller's inspection and test results. If the First Article parts are destroyed or rendered unsuitable for the intended use as a result of the First Article process, these parts shall not be counted towards meeting delivery quantity requirements.

- Supplemental FAIRs will normally be verified at the Seller's facility. DRS SSI may elect to have the First Article part/item/unit shipped to a DRS SSI facility for verification of supplemental FAIRs.
- Deliverable: Legible and reproducible copy of the First Article Inspection Report and the First Article Part/Item/Unit for DRS SSI approval prior to delivery of the first production lot, unless otherwise specified by the Purchase Order.

**QC221.6 – First Article Inspection - Desktop Review Requirement:**

*This QC Clause supersedes QC121 with alternate methodology as described within.*

The Seller shall perform a First Article Inspection (FAI) on Buyer controlled drawings and specifications in accordance with AS9102 latest revision for this purchase order if one of the following apply:

- First time submission (part or new supplier)
- Revision change affecting form, fit, or function
- A process change used to manufacture the part
- Change in manufacturing location (facility)
- 24 months or longer have passed since the supplier is last produced part
- As requested by DRS

All first article inspections performed by the seller will be accompanied with a First Article Inspection Report (FAIR) and all other approved documentation showing conformance to the contract, purchase order, drawing, or performance requirements specified by DRS.

**Note:** *This clause does not apply to COTS Items.*

- FAIR supplemental documents include material and processing certs, itemized (ballooned drawing) and other documents as required by Purchase Order.
- Shipment of the first production lot shall not be made until DRS SSI has notified Seller of FAIR approval, unless otherwise specified by the Purchase Order.
- The FAIR documents shall be submitted by upload to the DRS FTP Transfer Folder as instructed by DRS Supply Chain.
- The Supplier shall send a notification email to DRS Supplier Quality that FAIR documents have been uploaded to the DRS FTP Transfer Folder. The Supplier shall choose the email address based on the ship-to location as shown on the PO:
  - FOR SHIP-TO DESTINATION OF WEST PLAINS, MO. (Send notification to [SSIFAIR-WP@drs.com](mailto:SSIFAIR-WP@drs.com))
  - FOR SHIP-TO DESTINATION OF ST. LOUIS, MO. (Send notification to [SSIFAIR-STL@drs.com](mailto:SSIFAIR-STL@drs.com))
- Verification of the report by comparison with a physical unit/items/unit is not planned; however, DRS SSI reserves the right to require Seller to ship the First Article part/item/unit for verification prior to approval of the FAIR.
- Deliverable: Legible and reproducible copy of the First Article Inspection Report for DRS SSI approval prior to delivery of the first production lot, unless otherwise specified by the Purchase Order.

**QC221.7 – First Article:**

Inspection – Advance Submission: *This QC Clause supersedes QC121 with alternate methodology as described within.*

The supplier must submit the 1st Article Report and receive approval by DRS prior to shipment.

**QC221.8 – AS9102 First Article Inspection – Fitchburg:**

The Seller shall perform a First Article Inspection (FAI) on Buyer controlled drawings and specifications in accordance with AS9102 latest revision or a DRS-Power Technology Inc. (DRS- PTI) approved equivalent for this purchase order if one of the following apply:

- First time submission (part or new supplier)
- Revision change affecting form, fit, or function
- A process change used to manufacture the part
- Change in manufacturing location (facility)
- 24 months or longer have passed since the supplier has last produced the Item requested by DRS.

The seller shall use an independent method of inspection utilizing tooling that meets the requirements of QC103 to verify process capability and compliance to all Drawing/Specification and or Purchase Order dimensional characteristics. The following capability guidelines shall be applied to verify all dimensional characteristics.

- Tool must be capable of measuring feature and feature size (i.e., radius gage for radii, 24” caliper for 23” linear dimension, etc.)
- Tool must be capable of measuring feature with repeatable and reproducible results within 5%
- Tool must have sufficient capability to measure one decimal point beyond engineering requirements (e.g., 1.000” would require tooling to be capable of measuring 1.0000”)
- The use of inspection fixtures used in the acceptability of product must be properly validated and approved by DRS-PTI prior to use.

**NOTE:** The use of programmed type equipment (I.E. CNC, etc.) used in the machining, turning and or fabrication of the product is not acceptable as an independent method of inspection. DRS-PTI may provide the Ballooned Drawing(s) and AS9102 Inspection forms to assist the seller in documenting the FAI as required. All first article inspections performed by the seller will be accompanied with a First Article Inspection Report (FAIR) and all appropriate flow down documentation showing conformance to the contract, purchase order, drawing, materials, special processes or performance requirements as specified by DRS-PTI. The Seller shall submit as a deliverable to DRS-PTI for review and approval prior to shipment of the product.

All non-conformances noted during the FAI process must be reported to DRS-PTI via the DRS-PTI “Supplier Waiver” Form and must be approved by DRS-PTI. The approved Supplier waiver form must then be included and noted within the FAI Package before shipment can occur.

**QC221.9 – Seller Requirements for First Article Inspection – Daylight Solutions:**

The Seller shall perform a First Article Inspection (FAI) on Buyer controlled drawings and specifications in accordance with AS9102 latest revision or a DRS approved First Article Inspection Process, if one of the following conditions apply:

- When noted specifically on PO
- A process change used to manufacture the part
- Change in manufacturing location (facility)
- 24 months or longer have passed since the supplier has last produced part

Subassemblies and/or detail parts where the seller has design authority shall have FAI requirements as defined on the statement of work or purchase order. If the purchase order line item specifies a buyer or seller designed product that has standard catalog commercial-off-the shelf hardware included at the subassembly levels, FAI is NOT required for the standard catalog or Commercial-Off-The-Shelf (COTS) parts/assemblies. All first article inspections performed by the seller will be accompanied with a First Article Inspection Report (FAIR) and all other approved documentation showing conformance to the contract, purchase order, drawing, or performance requirements specified by DRS.

**Note:** This clause does not apply to purchase order lines that specify COTS Items.

**QC221.10 – First Article Inspection – Specific Requirements for Ft. Walton Beach, FL:**

The Seller shall perform a First Article Inspection (Full or Delta FAI) on DRS and/or Customer revision-controlled drawings such as Buyer controlled drawings, Source Controlled Drawings, Vendor Developed Item Drawings and specifications in accordance with AS9102 latest revision for this purchase order if one of the following apply:

- First time submission (part or new supplier)
- A change in engineering definition affecting design characteristics
- A change in manufacturing source(s), process(es), inspection method(s), tooling, materials/alternate materials, or location of manufacture
- A natural or man-made event, which can adversely affect the manufacturing process
- A change in the numerical control program or translation to another media
- An implementation of corrective action required to complete a previous FAI
- 24 months or longer have passed since the Supplier has last produced part
- As requested by DRS

Note: The FAI requirement does not apply to COTS items.

Each First Article Inspection Report (FAIR) package must include all the following items:

- Completed AS9102 Forms 1, 2 and 3
- Completed ballooned print
- Certificate of Conformance for the delivered part or assembly (ref QC113.1)
- Certificates of Conformance for all parts and materials used in the assembly (ref QC113.1)
- Full AS9102 for any sub-assemblies, including the PCB, custom hardware, cables, etc.



- These may be flowed down to the sub-tier supplier or performed by the prime supplier.
- All Certificates of Conformance for sub-components
- All inspection and test records
- Applicable supporting variation or approval requests (VPRs)

Delta FAIRs only require the engineering definition characteristics affected by the change to be evaluated.

Subassemblies and/or detail parts where the seller has design authority shall have FAI requirements as defined on the statement of work or purchase order.

DRS Supplier is responsible to submit FAIRs to DRS via the Net-Inspect web-based software.

### **QC222 – Advanced Product Quality Planning and First Article Inspection - Naval Power Systems:**

Suppliers to DRS Naval Power Systems (NPS) locations shall have a documented process detailing the planning and implementation of the manufacturing process against timing and product requirements using advanced product quality planning concepts with the intent of mitigating identified risks towards a (0) customer ppm ideal state. Process control elements defined in this section shall be completed, maintained (i.e., updated, as applicable, for product engineering changes, process improvements, and/or non-conformance corrective actions), and retained by the supplier.

#### **Process Flow Diagram:**

The Process Flow Diagram (PFD) is a schematic representation of the sequence of operations required to manufacture the product from receipt of goods to shipment of finished product to the customer. This encompasses the movement of product internally from one-step to the next, as well as movement to and from external operations. It also includes alternate processes i.e., different processes used to achieve the same output (e.g., backup equipment, secondary sources, etc.) that are intended to be qualified through first article samples.

The process flow diagram may apply to a group or family of products that are produced by the same process at the same source.

#### **Key Characteristics:**

Key characteristics are those product or process characteristics that are considered to have a significant impact on the form, fit or function of the part and/or influence customer perception of the end product. Key characteristics are those characteristics that are significantly impacted by the method of manufacture or have a significant impact on subsequent operations. Any Critical to Quality characteristics identified on a DRS drawing are to be considered as key characteristics.

Key characteristics shall be identified on related control plans, FMEA(s), FAIR reports, and manufacturing process documentation.

Suppliers shall identify and communicate any known product or process Pass-Through Characteristics to DRS. Pass-Through characteristics are those that cannot be verified through the supplier's production process controls such that DRS operations or its end customer will be the primary party to evaluate the conformance/compliance of the identified product characteristic. Supplier shall implement and document 100% in-process verification control as a preferred methodology to ensure production hardware quality and conformity to key characteristics. The supplier may implement Statistical Process Control (SPC) techniques as an alternate methodology.

o **Key Characteristics – Use of SPC Process Capability:**

On key characteristics where Statistical Process Control (SPC) has or will be applied, the supplier shall complete a process capability study for each key characteristic.

- The study must demonstrate a minimum Cpk of 1.33 or greater for production capability (raw data reports shall be retained by the supplier and provided upon request from the receiving DRS site).
- In the event that process capability is not demonstrated for key characteristics, these features shall be 100% in-process inspected and documented. Once capability is demonstrated, the feature can be reduced to a valid sampling plan.

The capability study will include at least 30 parts that have been consecutively run. If projected volumes are so low that 30 samples are not attainable prior to production, the supplier shall implement and document 100% in-process inspection verification until 30 consecutive samples are produced, measured, and the capability calculated and accepted.

**Failure Mode & Effect Analysis (FMEA) Requirements:**

Early in the program's design and/or manufacturing phase, the supplier is required to identify potential risks and the steps being taken to mitigate them. The manufacturer is required to perform a risk analysis of the design to the manufacturing process and identify mitigation plans for high risks using a FMEA methodology to complete a Process Failure Modes and Effects Analysis (PFMEA). (Reference: AS9145, AS13004, Automotive Industry Action Group (AIAG) FMEA).

The supplier shall complete applicable PFMEA(s) for the items produced and furnished as part of the purchase order. The PFMEA(s) may apply to a group or family of products that are produced by the same process at the same source.

**Process Control Plan:**

This is a written description of the measures for controlling the variations in the production manufacturing process in order to provide a production part within the acceptable limits defined by the drawing and specification requirements and/or other DRS authorized flow down requirements. It is designed to be a key reference for the Operator within the process on what

is required and is used alongside detailed Work Instructions / Process Instructions. (Reference: AS9145, AS13004, Automotive Industry Action Group (AIAG) Control Plan).

All controlled characteristics shall be listed on the control plan. The control plan may apply to a group or family of products that are produced by the same process at the same source.

**First Article Inspection Requirements:** *This content supersedes Quality Clause QC121 with alternate methodology as described within.*

Suppliers are required to have all production product qualified and maintained in accordance with the latest revision of AS9102 First Article Inspection Requirement. All necessary documentation to support compliance are to be completed prior to First Article submission and applicable product shipments may not be made by the supplier until FAI Form 1 approval is received from the appropriate NPS site Supplier Quality representative.

The seller shall perform a full or partial FAI for affected characteristics, when any of the following occurs:

- First time submission (part or new supplier)
- Revision change affecting form, fit, or function
- A process change used to manufacture the part
- Change in manufacturing location (facility)
- 24 months or longer have passed since the supplier is last produced part.
- Special request by DRS called out separately on the PO.

All first article inspections performed by the seller will be accompanied with a First Article Inspection Report (FAIR) for a minimum of (3) production pieces (100% of pieces for orders less than (3)) and all other approved documentation showing conformance to the contract, purchase order, drawing, or performance requirements specified by DRS.

The following is the minimum required for a complete FAI submission to the DRS Naval Power Systems location:

- FAIR as a deliverable with Balloon Prints
- Raw Material Certificate of Compliance for all specified materials
- Approved AS9102 compliant Form 1 (to include all Bill of Material items, if applicable), Form 2, and Form 3 documents
- Packaging definition
- Certificate of Compliance
- Approved Boundary Samples, and/or Visual Aids, if applicable
- Test Report(s), if applicable
- Approved SVR(s), if applicable
- Process capability study data, if applicable
- Approved Non-Destructive Test procedures and results, if applicable
- Identification of Pass-through Characteristics, if applicable
- Certifications/Approvals of special process procedures, if applicable

*Waivers for FAI submission elements may be provided through written authorization by the receiving site Supplier Quality Representative.*

**Note 1:** Functional verification of product or other customer specific verification may be required prior to receiving an FAI Form 1 approval disposition from NPS.

**Note 2:** This clause does not apply to COTS items. All COTS items shall be qualified to the requirements of QC113.1.

**Production Part Approval Process (PPAP):**

The PPAP requirement only applies if identified as a separate line item on the Purchase Order. Suppliers that are notified of this requirement shall ensure compliance with the latest Automotive Industry Action Group (AIAG) or AS9145 PPAP requirements.

Suppliers which are notified of this requirement on the PO are expected to ensure all PPAP elements are managed for compliance regardless of submission level requested by DRS. All necessary documentation to support compliance are to be completed prior to PPAP submission. The default submission level for PPAP will be Level 3, unless specified by DRS, with the supplier assuming responsibility to update appropriate elements of the submission and determine use of previous level data in compliance with PPAP requirements.

Suppliers shall notify/submit PPAP as per the requirements of the PPAP.

**Supplier Variance Requests:**

Product or Process supplier variance requests (SVR) may be requested by the supplier for any dimensional, specification, functional, or process related issues that cannot be mitigated and corrected prior to FAI submission or product shipments.

Suppliers shall complete and submit an appropriate Supplier Variance Report to their respective DRS Buyer for processing and disposition.

Supplier shall not ship product under an SVR without approval disposition unless notification is provided from the representative DRS buyer.

**QC223 – Supplier Kickoff Meetings / Production Reviews**

The following requirements apply to this line item if one of the following criteria are met:

- Supplier is delivering this part for the first time
- Supplier has not delivered this part in over 2 years

NPS has a supplier kickoff meeting / production readiness review process utilizing template NPS-4-050. Contact your NPS Buyer for the latest revision of this template. This process is broken up into two parts. Part one, referred to as the Kickoff Meeting, shall be conducted after the supplier completes their review of the purchase order, including applicable drawings, quality flowdowns, and supplementary documents/specifications. The purpose of this meeting is to perform a detailed review of the flowdowns, answer any supplier questions, and address any issues that may have been found during review of the documentation. Part two, referred to as the Production Readiness Review, shall be conducted prior to the supplier starting production on this

part number. The purpose of this meeting is to review the supplier's documentation, including manufacturing routers/process instructions, to ensure requirements were effectively captured. The supplier shall contact their NPS Buyer and Supplier Quality Engineer to schedule these meetings with as much advance notice as possible.

### **QC3XX Series Quality Clauses**

#### **QC303 – Unique Identification (UID) marking requirements:**

Unique Identification (UID) marking required on labels, decals or metal plates shall be per MIL-STD- 130 Identification Marking of U.S. Military Property. The UID marking shall have a minimum of Grade B when verified per ISO/IEC 15415 Information Technology Automatic Identification and Data Capture Techniques. Bar Code Symbol Print Quality Test Specification – Two-Dimensional Symbols.

Sampling of the verification of the UID marking requirements shall be per ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes using general Inspection Level II and single sampling plans for reduced inspection at an Acceptance Quality Limit (AQL) of 1.0. The first and last UID marking on labels, decals or metal plates of the lot shall be part of the samples that are verified.

For deliverables: a C of C stating that the labels, decals or metal plates were manufactured in accordance with MIL-STD-130 Identification Marking of U.S. Military Property and verified per ISO/IEC 15415 Information Technology, Automatic identification and data capture techniques—Bar Code Symbol Print Quality Test Specification –Two-Dimensional Symbols. The C of C shall also state the Grade that was achieved when verified per ISO/IEC 15415: A legible and reproducible copy of the verification that was performed on the labels, decals or metal plates of the sample shall be included with each shipment.

#### **QC304 – Eye Examinations:**

Personnel certified to perform Inspection and Test functions shall have periodic Eye exams (not to exceed 1 year). The standard of acceptance for vision test shall be:

- Natural or corrected near distance acuity such that the inspector / tester is capable of reading J1 letters on the standard Jaegers chart of equivalent for near vision. This requirement shall be met by either one or both eyes.
- Ability to distinguish between colors when required by work.

#### **QC305 – Qualified Products List (QPL):**

One or more of the items of this order are required to be produced by a Qualified Product Listed (QPL) supplier. Your certifications must contain evidence of manufacture by a QPL source.

#### **QC306 – Printed Wiring Boards (PWBs):**

PWBs shall be fabricated and tested in accordance with the applicable drawing. Solderability testing shall be in accordance with J-STD-003 Solderability Tests for Printed Boards. 100% Net List Testing is to be performed on all lots.

PWBs shall be rejected if all of the following are not provided:

- One coupon per panel is to be maintained by the supplier.
- Each PWB, and its associated coupon, shall be marked with a serial number traceable to the production panel.

- A copy of the lot inspection and acceptance data.
- A micro section report with the plated through hole copper thickness recorded for each inspection lot.
- A serial number list showing the final disposition of all PWBs/panels in the production lot.
- PWBs shipped to DRS must be packaged with desiccant and a moisture indicator.
- Date codes on PWDs must not exceed 365 days before the date of shipment to DRS.

**Note:** PWBs with date codes exceeding 365 days may be shipped to DRS with prior written approval. If the PWBs pass Solderability testing, the boards will be accepted.

**Note:** This clause does not apply to COTS Items.

**QC306.1 – Interconnect Stress Test (IST) Requirement:**

Bare boards shall be tested according to IPC-TM-650, Method 2.6.26 from coupons as outlined in IPC-6012 and inspected to IPC-A-600. Test coupon design, if not specified by DRS, is the supplier’s responsibility but requires approval prior to board fabrication. Test parameters will be determined using the smallest VIA diameter (mills (10-3in)), minimum trace width (mills (10-3in)), and number of layers. Table 1 shows the maximum resistance change, in percent, and the number of thermal cycles for testing. Regardless of complexity of the board all coupons are to be tested to 150 C. The coupons shall be located on two adjacent sides of the panel near the edge, and therefore oriented in the “x” and “y” axis. The first and last panel coupons will be the only coupons tested unless the number of panels is greater than 10. When the number of panels exceeds 10, both coupons from 50% of the full panel build will be tested in addition to the first and last panel coupons. Optional testing methodology, including modification of sample size and coupon features, is acceptable if approved by DRS.

Table 2: Test Parameters

Via Dia. (x10-3 in)	Trace Width (x10-3 in)	Number of Layers*						
		22	20	18	16	14	12	10
4	3	5%, 500	5%, 481	5%, 481	5%, 481	6%, 462	6%, 442	7%, 423
	4	5%, 481	5%, 481	5%, 481	6%, 462	6%, 442	7%, 423	7%, 404
	5	5%, 481	6%, 462	6%, 462	6%, 442	6%, 442	7%, 404	7%, 385
	6	6%, 462	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	8%, 365
	7	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	7%, 385	8%, 346
	8	6%, 462	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327
5	3	5%, 481	6%, 462	6%, 462	6%, 442	6%, 442	7%, 404	7%, 385
	4	6%, 462	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	8%, 365
	5	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	7%, 385	8%, 346
	6	6%, 462	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327

	7	6%, 442	7%, 423	7%, 423	7%, 404	7%, 385	8%, 346	9%, 308
	8	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327	9%, 288
6	3	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	7%, 385	8%, 346
	4	6%, 462	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327
	5	6%, 442	7%, 423	7%, 423	7%, 404	7%, 385	8%, 346	9%, 308
	6	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327	9%, 288
	7	7%, 423	7%, 404	7%, 404	7%, 385	8%, 346	9%, 308	10%, 269
	8	7%, 423	7%, 404	7%, 385	8%, 365	8%, 346	9%, 308	10%, 250

\* If layers < 10 use 10 Criteria, if Layers > 22 use 22 criteria

**Note:** Table information is (% Resistance, Cycles)

In the event of a test coupon failure, remove damaged coupon and continue testing remaining coupons, notify Leonardo DRS of the failure mode and number of cycles completed for further evaluation.

**QC308 – Calibration Sub-contractor Requirements:**

The item(s) on this purchase order shall be calibrated in accordance with the requirements of ANSI/NCSL Z540-3 Requirements for the Calibration of Measuring and Test Equipment or ISO10012-1 Quality Assurance Requirements for Measuring Equipment and traceable to the National Institute of Standards and Technology (NIST). The subcontracting, assigning, or transferring of any activities covered by this purchase order to another supplier facility/location or sub-supplier shall be approved by DRS site’s Quality Department.

The following information is to be submitted to DRS for each item of Material & Test Equipment (M&TE) completed.

Certification of Calibration and/ or Record of Calibration shall contain the following information:

- Title of document.
- Supplier’s name and address.
- DRS name and address.
- Description and unique identification of the item calibrated.
- Condition of the item calibrated if not operational.
- Date calibration performed.
- Identification of the procedure(s) used.
- Identification of the calibration service provider’s equipment, standards used and last calibration date.
- Environmental conditions (temperature and humidity).
- Test Report detailing As-Found and As-Left conditions.
- Reference to any independent Out-Of-Tolerance Condition Report.
- Signature and title of the person who performed the calibration.
- Statement that supplier equipment and reference standards utilized to calibrate DRS M&TE are traceable to NIST.

Attach the calibration sticker to the face area of any stackable equipment where the sticker will not impede visibility or functionality. Sticker must indicate the next calibration due date at a minimum.

**QC308.1 – Calibration Sub-contractor Requirements – Alternate Requirement:**

It is the seller's responsibility to ensure all equipment; including Customer Furnished Equipment (CFE), and Government Furnished Equipment (GFE), used to test and inspect DRS supplied parts are maintained and traceable to the National Institute of Standards and Technology (NIST) requirements. A calibration system in accordance with ISO 10012-1 Quality Assurance Requirements for Measuring and Test Equipment, ANSI/NCSL Z540-3 Calibration Laboratories and Measuring and Test Equipment – General Requirements, or equivalent will be used by the supplier.

**QC309 – As-Built List (ABL):**

The Supplier shall track and record the as-built configuration by serial number including serialized lower-level subassemblies. An ABL including the part number, serial number (when applicable), lot control numbers (when applicable), quantities, completion date and ship-to location shall be provided with the shipment.

**QC310 – Flow Plan:**

Manufacturing, Inspection, and Test: The Supplier shall provide a flow plan (any format: diagram, traveler, etc.) which documents the sequence, location, and description of manufacturing processes, inspections, and tests. The Flow Plan shall be submitted for DRS approval within thirty (30) days prior to use.

**QC311 – Circuit Card Assembly (CCA) Test:**

The Supplier shall perform 100% electrical testing on the CCAs as required by purchase order to identify any manufacturing defects prior to delivery. Tests such as In-circuit Test (ICT), Bed-of-Nails, Flying Probe, or other Manufacturing Defect Analyzer (MDA) may be used. CCA Test Reports including the CCA Test procedures conducted, pass/fail results by serial number, and authorization by a representative of the Supplier's Quality function shall accompany each shipment.

**QC312 – Data Deliverables:**

The Supplier shall provide a copy of any data deliverable for each item in the supplier's format or as authorized by a representative by the supplier's Quality function with each shipment.

The Supplier shall ensure that all personnel performing special processes, inspections and testing are certified to perform the function in accordance with the requirements of the referenced PO, and any specifications referenced directly or indirectly therein. The Supplier shall ensure the associated equipment and laboratory used for these processes is certified, as appropriate.

**QC312.1 – Data Deliverables: Non-Destructive Test report:**

(X-Ray, Ultrasonic, Liquid Penetrant, Magnetic Particle)

**QC312.2 – Data Deliverables: Critical Dimension Report:**

If any critical/interface dimensions are specifically identified on the drawing or purchase order, the supplier shall measure 100% of these dimensions for each unit supplied,



record the measurements taken on a Critical Dimension Report, and provide this report with each shipment.

**QC312.3 – Data Deliverables: Full Dimension Report:**

The supplier shall provide a Full Dimension report as specified in this Purchase Order.

**QC312.4 – Data Deliverables: Acceptance Test Procedure/Test Data Sheets:**

This ATP and any subsequent changes must be submitted for approval thirty (30) days prior to testing deliverable end items.

Completed Data sheets must contain at a minimum, identification of the item being tested (Part number, description, revision, and serial numbers, if applicable); the specification requirement; minimum and maximum limits; the actual recorded result; indication of pass or fail; the person performing the test/inspection and the date the test/inspection was performed.

**QC312.5 – Acceptance Test Plan:**

A detailed Acceptance Test Plan must be submitted to the DRS for review and approval. This plan shall consist of a test plan and list of equipment employed. Changes must be approved by DRS prior to first delivery against the Purchase Order.

**QC312.6 – Data Deliverables: Repair Reports:**

The Supplier shall provide a repair report, authorized by a DRS Representative and the Supplier's Quality function, that documents the materials, reason for repair and activities utilized in returning the equipment to fully functional status.

**QC312.7 – Data Deliverables: Inspection reports:**

The data must include the actual measured value and be traceable to the product lot code or serial number.

Dimensional Inspection data for all critical/major characteristics defined by the drawing and /or PO and indication of acceptance for minor characteristics shall be included in an inspection report on items delivered under this Purchase Order.

All Inspection records submitted are subject to DRS review and approval prior to acceptance.

**QC312.8 – Data Deliverables: Certificate of Analysis (C of A):**

C of A is required to accompany all materials supplied to an individual purchase order.

For metallic materials:

- Include chemical, mechanical and all test results required per applicable material specification(s) unless otherwise specified.
- The C of A will include:
  - Customer Name
  - Manufacturer's Name
  - Country of origin/melting/smelting
  - Specification number (and revision, when invoked by DRS purchase order)
  - Material generic alloy, condition, type, size, shape/form
  - Heat lot, number

For non-metallic materials:

- Include test results required per DRS purchase order requirements and applicable specification(s).
- The C of A will include:
  - Customer Name
  - Specification number (and revision, when invoked by DRS purchase order)
  - Detailed information required by DRS purchase order (example: test report number, manufacturer's name, date code, batch number, DRS part number, DRS purchase order number, etc.)

**QC312.9 – Data Deliverables: Certification of Solderability:**

The supplier shall perform Solderability testing as specified by this Purchase Order.

**QC312.10 – Data Deliverables: Welding Certifications:**

The supplier shall provide Welding Certifications as specified by this Purchase Order.

**QC312.10.1 – Data Deliverables: Welding Certifications Land Systems**

The supplier shall provide evidence of Weld Procedures, Weld Performance and Weld Inspection Qualification as specified by this Purchase Order. The evidence shall include Welding Procedure Specifications (WPS), Procedure Qualification Records (PQR) and Weld Inspection Performance Qualification documentation in accordance with the applicable welding code and specification defined for the item.

**QC312.11 – Data Deliverables: Hydraulic Cleanliness:**

The supplier shall provide Hydraulic Cleanliness reports as specified in this Purchase Order.

**QC312.12 – Data Deliverables: Supplier Inspection & Test Plan:**

Supplier shall prepare a detailed inspection plan including all measurement and testing methods. The plan shall include name, type, accuracy and calibration date of measuring and test equipment, as well as measuring record forms that are required for in-process and/or final acceptance of product. For measurement or testing of parts performed in-process, plan shall include process flow. Inspection plan requires by DRS SQE approval prior to delivery of the first product.

**QC312.13 – Data Deliverables: Qualification Test Reports:**

The supplier shall provide Qualification Test Reports as specified in this Purchase Order.

**QC312.14 – Data Deliverables: Certificate of Test (C of T):**

All parts supplied to this purchase order will be accompanied by a C of T. The C of T will be dated and signed by the responsible company representative certifying the supplied parts meet all purchase order, specification, and drawing requirements from the buyer. Certifications must include the following:

- DRS PO Number
- DRS Part Number, Revision, Serial Numbers and Date/Lot Codes where applicable
- Purchase Order Quantity
- Quantity Shipped

- Name of approved lower-tier supplier and descriptions of service provided (if applicable)
- Authorized signature and date
- Name and Address of the tester or independent laboratory
- Date and run time, if applicable

**QC312.15 – Data Deliverables: Cable Harness Test Report:**

Supplier shall provide DRS the continuity test detailed results for all short and open connections and fiber optics signal loss where applicable that verify conformance to specifications.

**QC312.16 – Data Deliverables: Circuit Card Assembly (CCA) Test:**

The Supplier shall perform 100% electrical testing on the CCAs as required by purchase order to identify and correct manufacturing defects prior to delivery. Tests such as In-circuit Test (ICT), Bed- of-Nails, Flying Probe, or other Manufacturing Defect Analyzer (MDA) may be used. CCA Test Reports including the CCA Test procedures conducted, pass/fail results by serial number, and authorization by a representative of the Supplier's Quality function shall accompany each shipment.

**QC312.17 – Data Deliverables: Certification of Special Processes:**

The supplier shall provide a Special Process Certification as specified in this Purchase Order.

**QC312.18 – Data Deliverables: Inspection reports - Fitchburg:**

The data must include the actual measured value and be traceable to the product, lot code or serial number as applicable to Purchase Order and Drawing requirement. Dimensional Inspection data for all critical/major characteristics defined by the drawing and /or PO and indication of acceptance for minor characteristics shall be included in an inspection report on items delivered under this Purchase Order.

The seller shall use an independent method of inspection utilizing tooling that meets the above statement to verify process capability and compliance to all drawing/Specification and or Purchase Order dimensional characteristics. The following capability guidelines shall be applied to verify all dimensional characteristics.

- Tool must be capable of measuring feature and feature size (i.e., radius gage for radii, 24" caliper for 23" linear dimension, etc.)
- Tool must be capable of measuring feature with repeatable and reproducible results within 5%
- Tool must have sufficient capability to measure one decimal point beyond engineering requirements (e.g., 1.000" would require tooling to be capable of measuring 1.0000")
- The use of inspection fixtures used in the acceptability of product must be properly validated and approved by DRS-PTI prior to use.

**Note:**

The use of programmed type equipment (I.E. CNC, etc.) used in the machining, turning and or fabrication of the product is not acceptable as an independent method of inspection. All Inspection records submitted are subject to DRS review and approval prior to acceptance.

**QC319 – Source Inspection at Seller’s Facility:**

Parts and materials supplied to this PO require source inspection by DRS or representative prior to shipment. This requirement must not be bypassed without written authorization from the DRS buyer. The Supplier shall notify DRS at least ten (10) days in advance of the date material is expected to be ready for inspection. Mandatory Hold Points (MHP) may be required. DRS may designate MHP defining operations in the Supplier’s manufacturing and/or inspection sequence that are required to be witnessed by DRS or its Customer prior to completion by the Supplier. This activity shall be performed in such a manner to not disrupt normal processing and shall be conducted on a non- interference basis. If any inspection or test is made by DRS, and/or DRS customers, of a Supplier or a subcontractor, the Supplier without additional charge, shall provide a safe place to work and reasonable facilities and assistance for the convenience of DRS, and/or its Customer(s) in the performance of their duties. If DRS and/or DRS Customer(s) requires that an inspection or test is made at a point other than at the premises of the Supplier or a subcontractor, it shall be at the expense of the DRS except as otherwise provided in the PO; Provided that, in case of rejection, DRS shall not be liable for any reduction in value of samples used in connection with such inspection or test.

**QC319.1 – Source Inspection at Seller’s Facility – St Louis Special Requirements:**

DRS SSI Source Inspection is required in your plant prior to shipment of specified product. The Seller shall furnish, at no cost to DRS SSI, test data, equipment, and facilities necessary to accomplish product inspection to applicable drawings, specifications, and other requirements. DRS SSI's Field Quality Representative reserves the right to re-inspect or re-test specified product, review processes, and review/audit facilities. FINAL ACCEPTANCE OF PURCHASED PRODUCTS SHALL BE AT DRS SSI FACILITIES.

DRS SSI’s packaging slip and / or shipper shall be stamped or signed by DRS SSI's Supplier Quality Representative and must accompany shipping documents. When requesting source inspection, contact DRS SSI Supplier Quality at least five (5) working days in advance at [www.SSIsgastl@drs.com](mailto:www.SSIsgastl@drs.com).

Deliverable: DRS SSI Supplier Quality Representative’s stamped or signed packaging slip and / or shipper required with each shipment.

**QC319.2 – Pre-cap Inspection at Seller’s Facility:**

Pre-cap inspection is required to be performed with the pre-conditions set forth in QC 319 above (notification, access, and availability of resources) but is to be performed in accordance with the governing military specifications, drawing or specifications specified by the DRS purchase order.

**QC320 – Government Source Inspection (GSI):**

If specified in the PO, Government Source and/or Process Inspection (GSI) shall be required prior to shipment from the Supplier’s facility. Upon receipt of this order, promptly notify and provide a copy of this purchase order to the Government Representative who normally services the facility so that appropriate planning for Government inspection can be accomplished. In the event the representative cannot be located, supplier shall contact the DRS Purchasing Representative. Unless otherwise agreed to in writing, the Supplier shall provide the Government Representative with:

- Ten (10) working days advance notification of readiness for performance or witnessing of government designated inspections or test.
- All applicable documents requested and reasonable conditions for conducting or witnessing the inspection or test.

**QC321 – Machined Parts:**

When the following parts, characteristics or processes are required by drawings, the supplier shall comply with the following additional instructions:

- Serial Numbers: The supplier must contact the DRS Purchasing Representative and request serial numbers before manufacturing begins. Serial numbers are controlled and issued by DRS to avoid duplication and meet specification requirements.
- Anodize: When MIL-A-8625 Anodic Coatings for Aluminum and Aluminum Alloys is invoked by drawing, the sealing must be done only in boiling, de-ionized water to provide natural appearance when performing compliance to Paragraph 3.8.1.1 of the standard unless otherwise specified by the drawing.
- Machined springs: Three extra slugs, suitable for hardness testing are to be heat treated with the lot of parts and delivered with the shipment.

**Note:** *These should be made by cutting one rough machined slug into three (3) approximately equal pieces. The Certificate must list the hardness and three (3) slugs. Additional requirements per “Detector Parts” also apply as follows:*

- Detector Parts: QC323 applies to: Bodies (most are machined from forgings), Core Guides and Fittings and/or End caps, including parts that become assembled to the body or guide (aka “Internals”).
- Revision Controls: Revisions listed in the applicable Mil-Spec Index apply to the specifications invoked by the drawings and procedures for detector parts. The supplier must comply with these revisions. The majority of specifications affect raw materials and processes including but not limited to include, stainless steel, anodizing, heat treating, dye penetrant, ultrasonic testing, etc. The Supplier must contact the DRS Purchasing Representative and request the applicable revision controls before manufacturing begins.

**Note:** *Cleanliness: Pay special attention to the bottom of Blind or Tapped holes.*

**Note:** *This clause does not apply to COTS Items.*

**QC322 – Material Control System (MCS-6B):**

When the part number listed on the Purchase Order contains the suffix “MCS6B” then the supplier, and their subcontractors, are required to control raw materials and parts at all times, to maintain traceability to the material certifications, test data, inspections and any processing performed, in accordance with the detailed methods of DRS-CCI documented plan as specified by the PO. Serial numbers and codes are controlled and issued by DRS-CCI. Supplier must contact the DRS-CCI buyer to request serial numbers before manufacturing begins. Supplier shall generate records that document clear, unquestionable traceability from serial numbers (S/Ns) or DRS-CCI assigned codes to test data and inspections performed. Objective evidence of traceability control shall be on file and may be subject to DRS- CCI review and/or audit. Parts are to be

shipped in "MARKED" containers supplied by DRS. Additional requirements per "Detector Parts" also apply per QC323.

### **QC323 – Critical Control Systems:**

This applies to "Detector Parts" per QC321. The Supplier shall establish and maintain a manufacturing, inspection, and test program, audited, and approved by DRS-CCI as meeting the requirements of MIL-STD-2041 Control of Detrimental Materials; MIL-STD-1370 (Controlled Distribution) Materials and Process Standard for Instrumentation and Control Equipment; MIL-STD-1308 Material Application and Processing Requirements, and/or as otherwise invoked in the purchase order. Any changes to programs must be submitted to DRS-CCI for review and approval prior to implementation in accordance with the purchase order.

### **QC324 – Naval Nuclear Purchase Order Requirements:**

#### **1.0 Rights in Technical Data and Computer Software**

In addition to Leonardo DRS Terms and Conditions as found on the Leonardo DRS web site ([www.drs.com/suppliers](http://www.drs.com/suppliers)), the following clauses and provisions of the FAR and DFARS, as indicated, in effect as of the date of this order, are incorporated by reference, with the same force and effect as if the clause(s) were provided in full text as modified:

- DFARS 252.227-7013, Rights in Technical Data - Noncommercial Items is changed as follows:
  - Paragraphs (f) (2) through (f) (5) are deleted and replaced as follows:
  - Except to the extent explicitly set forth in this order, the only authorized markings will be in accordance with Attachment 1, paragraph 1.
- Paragraph (h) is deleted and replaced as follows: (h) Removal of Unauthorized Markings Notwithstanding any provision of this order concerning inspection and acceptance, Buyer and the Government may correct, cancel, or ignore any marking not authorized by the terms of this order on any technical data furnished hereunder in accordance with "Validation of Restrictive Markings on Technical Data".
- Correction of nonconforming markings is not subject to this clause entitled "Validation of Restrictive Markings on Technical Data". The Buyer and/or the Government may, at the Seller's expense, correct any nonconforming markings. If Buyer or the Government notifies the Seller, and the Seller fails to correct the nonconforming markings within sixty days.
- Paragraphs (l) and (m) are added as follows: (l) Post Award Negotiation

If, after exhausting all reasonable efforts, the parties fail to agree on the apportionment of the rights in technical data furnished under this order by the date established in the order for agreement, or within any extension established by Buyer or the Government, then Buyer or the Government may establish the respective data rights of the parties. Challenges shall be in accordance with this Article (i) DFARS 252.227-7037. However, nothing shall excuse the Seller from proceeding with the order pending resolution of any such challenge.

(m) Technical Data Pertaining to Nuclear Propulsion Plant Systems.

Pursuant to subparagraph (b)(1) of DFAR 252.227-7013, it is agreed that all technical data pertaining to nuclear propulsion plant systems have been, or will be

developed exclusively with Government funds, and that all technical data generated under this order, and all technical data required to meet order requirements shall be provided to the Government with unlimited rights.

It is further agreed that promptly after delivery of all purchase order deliverables, or after any termination of all work under this purchase order, the Seller shall submit a letter report to the Buyer listing and providing a brief description of all items of technical data, pertaining to the deliverables developed or prepared under this purchase order. The Seller shall furnish in the Seller's format, and at the cost of reproduction, with unlimited rights, copies of the items of technical data so reported or which should have been reported, as the Buyer may require in writing from time to time. However, nothing in this requirement shall require the Seller to retain any item of such technical data beyond the period provided for in this purchase order, including the specifications, and other documents incorporated by reference, applicable to the item or type of technical data involved.

- DFARS 252.227-7014, Rights in Noncommercial Computer Software and Noncommercial
  - Computer Software Documentation is changed as follows:  
Paragraphs (f) (2) through (f) (5) are deleted and replaced as follows:
  - Except to the extent explicitly set forth in this order, the only authorized markings will be in accordance with Attachment 1, Paragraph 2.  
Paragraph (h) is deleted and replaced as follows: (h) Removal of Unauthorized Markings Notwithstanding any provision of this order concerning inspection and acceptance, Buyer and the Government may correct, cancel, or ignore any marking not authorized by the terms of this order on any computer software/computer software documentation furnished hereunder in accordance with the clause of this order entitled "Validation of Asserted Restrictions-Computer Software". Correction of nonconforming markings is not subject to this clause entitled "Validation of Asserted Restrictions-Computer Software". The Buyer and/or the Government may, at the Seller's expense, correct any nonconforming markings if Buyer or the Government notifies the Seller, and the Seller fails to correct the nonconforming markings within sixty days. Paragraphs (l) and (m) are incorporated here the same as added paragraphs (l) and (m) to DFARS 252.227-7013 above, except that all paragraphs (l) and (m) references to "technical data" are deleted and replaced with "computer software and computer software documentation". DFARS 252.227-7030, Technical Data - Withholding of Payment, modified as follows: Subparagraph (a) at the end of the first sentence, delete "or amount unless a lesser withholding is specified in the contract" and insert "or \$100,000.00, whichever is less".

## **2.0 Patent Rights – Ownership by the Government**

- [This Article applies only to (i) POs or amendments thereto, regardless of tier, placed with businesses other than small business firms and/or nonprofit organizations (ii) for the performance of experimental, developmental, or research work (includes "design" and "design and furnish" scopes of work). With regard to this latter condition, if any part of this order or amendment is for the performance of experimental, developmental or research work then this clause applies.]

- The Government shall retain the Patent Rights set forth in FAR 52.227 13, Patent Rights
- Acquisition by the Government.

### **3.0 Patent Rights - Small Business Firm or Nonprofit Organization**

- This Article applies only to (i) POs or amendments thereto, regardless of tier, placed with small business firms and/or nonprofit organizations (ii) for the performance of experimental, developmental, or research work (includes "design" and "design and furnish" scopes of work). With regard to this latter condition, if any part of this order or amendment is for the performance of experimental, developmental or research work then this clause applies.
- Patent rights shall be retained under this order as set forth in FAR 52.227 11, Patent Rights
- Retention by the Contractor (Short Form).

### **4.0 Fraud or Falsification**

- This Purchase Order and activities hereunder are within the jurisdiction of the Department of Energy and/or the Navy. Any knowing and willful act to falsify, conceal or alter a material fact, or any false, fraudulent, or fictitious statement or representation in connection with the performance of work under this Purchase Order may be punishable in accordance with applicable Federal Statutes.
- Seller agrees that all employees engaged in the performance of this Purchase Order will be, if they have not been previously, informed in writing prior to commencing performance of work under this Purchase Order that there is a risk of Federal criminal penalties associated with any falsification, concealment, or misrepresentation in connection with work performed under this Purchase Order. Seller agrees that a signed statement shall be, if it has not been previously, obtained from said employees prior to their commencing performance of work under this Purchase Order that they have been so informed. Such statements shall be retained by the Seller for at least three years after final payment on this Purchase Order. An acceptable form for such a statement is substantially as follows:
  - o "This company/division/department/branch performs work under contracts which are within the jurisdiction of departments of the United States Government. Some of the work performed under these contracts affects the national security of the United States and the requirements of these contracts are designed to ensure that essential attributes of the work are carefully checked or inspected and that records accurately reflect the results of all work. Any falsification, concealment, or alteration of any material fact, or any false, fraudulent or fictitious statement or representation in connection with the work under any contract within the jurisdiction of the Government is not only prohibited by company policy but may also be punishable under Federal Law. Please acknowledge by your signature that you have read and understand the above."
- Seller must also agree to include the following statement preprinted on each manufacturing, inspection or test record used in conjunction with the subject subcontract:



**Note:** *The recording of false, fictitious, or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute.*

- Seller shall include all provisions of this Article including this sentence in all lower-tier contracts under this Purchase Order. Any inability or unwillingness of a lower-tier supplier to comply with this provision should be documented in writing and submitted to the Buyer.
- The Buyer provides goods and services in support of the Department of Defense of the United States of America. As such, Seller warrants that Seller's employees visiting or performing services at Buyer's facility shall be U.S. citizens or naturalized U.S. citizens and do not represent a foreign interest or foreign company. Visits or performance of services by Seller's employees who are not U.S. citizens requires prior written approval by the Buyer's Facility Security Officer and if approved, will require a Buyer appointed escort.

### 5.0 Disclosure of Information

- General Requirements. The Seller shall not release to anyone outside the Seller's organization any unclassified information, regardless of medium (e.g., film, tape, document, display brochure, etc.), regardless of purpose (e.g., P.O. Performance, advertising, promotion, etc.) pertaining to any part of this Purchase Order or any program related to this Purchase Order unless:
  - The Buyer has given prior written approval; or
  - The information is otherwise in the public domain before the date of release.
- Request Format and Timing. Requests for approval shall identify the specific information to be released, the medium to be used, and the purpose of the release. The Seller shall submit its request to Buyer at least forty-five days before the proposed date for release.
- Exception/Approval. In accordance with Paragraph (a) (1) above, approval is granted to Seller so that, as necessary, it may disclose unclassified information, including sensitive unclassified information, to entities under subcontract either actually or prospectively, (including sub-tier orders), regardless of tier, under the Purchase Order for the provision of Naval Nuclear Propulsion Program (NNPP) supplies or services, entities of the Federal Government; and other entities performing NNPP work. This authority does not authorize Seller to release any information under or related to the subject Purchase Order to any entity not specified above, or not specifically affiliated with Seller under the subject purchase order through a contractual or prospective contractual relationship. Moreover, approval for release of information to sub-tiers and other entities with which Seller has a contractual or prospective contractual relationship does not extend to those entities who, regardless of relationship, do not have in place proper safeguards and procedures for receipt and handling of the sensitive information. The requirements of paragraph (a) and (b) above remain in effect as set forth and Seller must receive approval for release to any entity not covered by the authority set forth in this paragraph (c).
- Litigation. Should any information described in (a) above be requested, subpoenaed, or otherwise sought by a court or other judicial or administrative authority, this should be promptly brought to the attention of the Buyer to permit appropriate measures to be taken to protect the information.

- Under no circumstances should information, other than paragraph (a) (2) information, be released to such authority without prior notification to, and agreement of, Buyer.
- Survivability. Seller agrees that the requirements of this Article, to include Seller's obligation to obtain prior Buyer approval of any release other than a paragraph (a) (2) or (c) release, shall survive the Purchase Order and that Seller shall not for a period of twenty years subsequent to the issuance of the purchase order either directly or indirectly issue any such release without the requisite approval of Buyer, its successors or assignee.
- Mandatory Pass Down. Seller shall include all provisions of this clause in all sub-tier orders under this Purchase Order. Sub-tier requests for authorization to release information shall be submitted through Seller to Buyer.

#### **6.0 Cost Support and Certification Relative to Amendments:**

- (Applicable only to POs Equal to or exceeding \$650,000 where cost or pricing data may be required in support of the U.S. Naval Nuclear Program)
  - Except where Seller demonstrates upon sufficient evidence that a FAR 15.403- 1(b) exception applies, Seller shall furnish cost or pricing data at the threshold specified in FAR 15.403-4 (a) (1) via a properly executed NN-P47, Contract Pricing Proposal Cover Sheet, for (i) any proposed amendment to this order with a price impact aggregating in excess of this threshold; (ii) in support of final price agreements or termination settlement agreements which exceed this threshold.
  - Seller shall furnish properly executed SFs 1428 through 1440 in support of final price agreements and termination settlement agreements.
  - Upon completion of negotiations relative to the proposals described in a (i) and (ii) above, Seller shall, within five working days, submit an updated NN-P47 and an NN- P34, Certificate of Current Cost or Pricing Data.

#### **7.0 Naval Nuclear Information**

- NN-801 – Control and Protection of Unclassified Naval Nuclear Propulsion Information
- NN-802 – Control and Protection of Classified Naval Nuclear Propulsion Information
- NN-817 – Naval Nuclear Propulsion Information (NNPI) Guide

#### **QC325 – Commercial Nuclear Quality Assurance (NQA):**

##### **1.0 Qualification of suppliers, sub-tier vendors including special processes (Nuclear Quality Assurance, NQA)**

Suppliers and sub-tier vendors providing products and services in fulfillment of the purchase order are to be a DRS-CCI approved source for which the supplier will have to be audited by DRS-CCI Quality Assurance (QA) prior to the initiation of a purchase order. DRS-CCI reserves the right of access to suppliers and sub-tier vendor's facilities for the purpose of performing a commercial grade survey and source surveillance/inspection as applicable. Suppliers are required to flow this requirement down to sub-tier vendors, including Bare Printed Wiring Boards; Circuit Card Assemblies, Test Services, Engineering Services, Transformers; Power Supplies; Plating; Painting; Welding/Brazing; electro-magnetic interference (EMI) Filters; Relays; Sheet Metal Fabricators; and others as required by PO.

**Note 1:** *Certificate of Conformance is required for all items listed above.*

**Note 2:** *Test data is required as applicable for each product type.*

## **2.0 Notification of Significant Defects and Deficiencies in Supplied Product (NQA)**

- The supplier shall notify DRS-CCI QA in writing within five (5) days of the discovery of any defect or deficiency in design, material, or manufacture of any item shipped to DRS-CCI under the PO. The notification shall describe the nature of the discovered anomaly, its applicability to DRS-CCI part number(s), quantities affected, and the probable impact to the proper function/performance of the item supplied.

## **3.0 Certification of Test and Inspection Personnel (NQA)**

- All supplier test and inspection personnel performing activities on this purchase order shall be trained and certified to a DRS-CCI QA approved training and certification program. Such a program shall contain, as a minimum, a procedure detailing the requirements for individualized training and certification for specific test/inspection activities, records of personnel education level, work history/experience, training sessions attended, and a record of certification signed by Quality Management attesting that the individuals have received the proper training/experience commensurate with the activities performed.
- All test fixtures, jigs, go/no-go devices, templates, mock-ups, and any and all other inspection/measuring aides that do not require a calibration under the supplier's M&TE program shall be certified in a manner acceptable to DRS-CCI QA. The method and results of certification shall be documented and traceable to the devices utilized. DRS-CCI QA may require that such certification/recertification of said devices be performed in their presence upon request.

## **4.0 Calibration Program**

- In addition to meeting QC308 Calibration requirements above, the suppliers or sub-tier suppliers performing calibration activities must maintain a calibration program in accordance with ISO/IEC17025.17025 General Requirements for the Competence of Testing and Calibration Laboratories. The supplier shall have a documented process for qualifying their external calibration service providers. Examples of acceptable qualification methods include third party certification by NAVLAP/A2LA, on-site surveys by the supplier, etc.
- Before, during and after the performance of this order, DRS, DRS-CCI Customers, and/or a regulatory or statutory agency including Government Representatives, reserve the right to attend, review, and participate in the Supplier's Quality System and associated manufacturing processes including inspection and testing of any work related to this contract. DRS, DRS-CCI Customers, and/or regulatory or statutory authorities shall be afforded the right to verify at the supplier's premises (or Supplier's subcontracting premises) that the supplier's product conforms to all specified requirements.

## **QC326 – Quality Program Requirements (NQA):**

This is a safety related order. The seller shall maintain a Quality Management System that complies with the requirements of 10CFR, Part 50, Appendix B; 10CFR, Part 21 and NQA-1.

**QC327 – Seal, Gasket, O-Ring, etc. (Newport News):**

When the drawing requires the use of DRS- CCI Procedure JBL60 Procurement Requirements for Non-Metallic O-Rings and Gaskets, and “contacts system fluid” or “wetted” then additional Quality Clause QC318 applies.

- Age Control of rubber seals and gaskets in assemblies is required as follows:
  - A tag shall be attached to each assembly containing rubber (elastomeric) parts which are not in their final compressed state and shall contain the following information for each rubber (elastomeric part):
    - Manufacturing specification or standard of the rubber (elastomeric) part.
    - Cure date – quarter and year (e.g., 3Q85).
    - Expiration date based on the cure date and shelf life imposed by the age control requirements invoked by the rubber (elastomeric) specification.
  - Rubber (elastomeric) parts furnished with an assembly but not inserted in the assembly or used on the external portion of an item shall be packaged and tagged as follows:
  - Each O-ring, quad-ring, v-ring seal, and/or packing ring shall be separately packaged in an envelope consistent with the size of the ring in accordance with Section in 3.2 of Military Specification MIL-P-4861 (Packing, Preformed, and Rubber Packaging of).
  - Packages shall be opaque and sealed greaseproof/waterproof bags as specified in Sub- Method IC-1 of Military Specification MIL-P-116 (Military Specification Preservation, Methods of).
  - No preservative is to be added.
  - The packages shall be securely attached to each assembly by taping or other suitable means.
- Opaque packages for each item shall be marked on the exterior with the following information:
  - DRS-CCI purchase order and item number
  - Manufacturing specification or standard
  - Cure date – quarter and year (e.g.,3Q85)
  - Expiration date based on the cure date and shelf life
  - Vendors part number/identification number

**QC330 – Returned Supplier Material:**

Supplier material delivered on the PO that is rejected and returned to the Supplier on a supplier Return Material Authorization (RMA) for evaluation and rework/repair, shall be shipped by the Supplier with a rework/repair report that documents the failure description, detailed failure causes, and repair actions taken to restore the material to the PO requirements. The Supplier shall reference the RMA number on the shipping documents. If the material is subject to GSI, it shall be resubmitted to the Government for acceptance prior to shipment to DRS.

Materials shall not be returned to DRS as “no fault found” without a written consent from the DRS Buyer.

**QC330.1 – Returned Supplier Material:**

This QAC specifies the requirements for visual examination, evaluation, repair and/or upgrade of product that has been returned by the Buyer to the Seller for repair and/or upgrade. See DRS Buyer for detailed requirements.

**QC330.2 – Returned Failure Analysis Report:**

All returned products must have a failure analysis report completed within fifteen (15) days of receipt of the product. Upon receipt, the Seller is to perform the actions necessary to 1) investigate the returned unit, 2) confirm the failure mode and 3) plan and (when authorized by the purchase order), perform the rework necessary to restore the unit to working condition.

The report shall document the DRS purchase order number, DMR number (if provided by DRS), part number, serial number, cause of the failure, corrective action to preclude recurrence and effect on other delivered product. The failure analysis report must accompany the product when returned to DRS.

**QC331 – Delegation of Verification (Designated Supplier Quality Representative):**

The Supplier has been granted the authorization to perform verification activities on behalf of DRS. Verification is defined as any inspection or other actions necessary to ensure the product meets specified purchase requirements. Product thus supplier verified will replace the DRS Receiving Inspection function. This delegation should be viewed as a privilege and can be revoked at any time. The following conditions shall be met:

- Maintain status as an approved supplier to DRS.
- Maintain a minimum of ISO 9001 Quality Management System certification by an accredited agency.
- The Supplier shall appoint personnel to act as a Designated Supplier Representative (DSR) from their Quality Assurance department. The DSR shall have experience with DRS specifications, standards, and product to assure that all requirements are met. The Supplier is responsible for performing all inspections required to ensure compliance of the deliverable product with all purchase document requirements.
- Supplier's DSR shall sign and/or stamp and date the shipping document (C of C) on behalf of DRS to indicate acceptance of the item(s) being shipped.
- Supplier verification activities do not absolve the supplier of its responsibility to comply with end customer source inspection and/or GSI requirements.

DRS may suspend delegation when a supplier:

- Exhibits an unacceptable quality level.
- Failure to respond to corrective action request(s).
- Unauthorized or improper acceptance of product(s).
- Change in ownership or location.

**QC332 – Supplier Material Review Board (MRB) Authority Alternate:**

The Supplier does not have MRB authority to accept or repair nonconforming products being delivered. Any nonconformance on the final deliverable product to the purchase order, drawing, specifications, or applicable documents must be

submitted to DRS for approval prior to usage or shipment, unless otherwise documented.

**QC333 – AGE CONTROL OF RUBBER GOODS, SAE AMS 2817 / SAE ARP5316:**

Rubber products shall be packaged in accordance with the drawing requirement and SAE AMS2817/ SAE ARP5316, as applicable. Packages shall be marked appropriately.

**QC334 – REQUIREMENTS FOR CASTING (TEST BARS):**

The Seller shall maintain and furnish upon request the following for a period of 5 years:

- Two (2) test bar specimen's representative of the procured casting material composition and heat-treat process for each lot.
- Specimens shall conform to all material and process specifications in accordance with the purchase order and/or drawing. (B) One (1) spectrographic disc representative of the entire heat or melt.
- Castings, test bars and discs, where applicable, shall be permanently identified with seller's name and/or trademark, melt and heat treat number and alloy identification.
- Casting inspection shall be in accordance with SAE-AMS-STD-2175, class and grade as specified on the purchase order and/or drawing.

**QC335 – WITNESS SAMPLES / COUPONS:**

Seller shall provide lot-related witness and/or coupon samples for all First Article Inspection (FAI) reports as specified by the technical data package. All other witness samples for production lots will be retained by the supplier and provided to DRS upon request.

**QC336 – MIL-PRF-22750 OR MIL-DTL-53039 OR MIL-DTL 64159 ORGANIC AND CHEMICAL RESISTANT (CARC) / SURFACE FINISHES:**

The seller must deliver one (1) copy of the actual validation letter from the Department of the Army, Fort Belvoir, Virginia. The Certificate(s) of Compliance that accompany the shipment must list the manufacturer, batch/lot number, color, and the specification number with applicable revision, with each shipment.

**QC337 – Supplier Process Control:**

These requirements apply to suppliers, and to their sub-tier suppliers. The Contractor shall utilize Statistical Process Control (SPC) techniques as a preferred methodology to ensure production hardware quality and conformity. SPC shall be used to measure, analyze, and eliminate sources of variations detrimental to product quality. SPC shall be administered by the contractor in areas of highest potential benefit and/or on Critical Characteristics flowed down in drawings. The contractor shall prepare a Process Control Plan which will be utilized during production of the articles ordered under this contract. The program should contain the following as a minimum:

- **Process Flow Diagram:**
  - This is a schematic representation of the process flow and the sources of variations of equipment, materials, methods, and people from the start to the end of the suppliers' process. The flow diagram should show the test and inspection points as well as those characteristics that are to be monitored and/or statistically controlled (SPC).
- **Key Characteristics:**

- Key characteristics are those product characteristics that are considered to have a significant impact on the form, fit or function of the part and/or influence customer perception of the end product. Key characteristics are those characteristics that are significantly impacted by the method of manufacture or have a significant impact on subsequent operations.
- Key characteristics shall be identified on drawing features with symbol “Δ” with an accompanying notation that identifies the feature as a critical characteristic or with the symbol (CTQs based on Geometric Dimensioning & Tolerancing techniques).

**Note:** When suppliers do not deliver products based on DRS drawings and no CTQs are defined (ex., Performance Specification Contracts), Key Process Indicators (KPIs) from the supplier may be used. Key Performance Indicators (KPIs) are monitored metrics that “indicate” how well a process or product is performing. KPIs can be either product performance parameters or process performance metrics (i.e., Yields, FPY, Attribute SPC, etc.) These KPIs should be agreed upon between DRS and Supplier and shall be included on the PO.

- **Process Capability:**

- On key characteristics where Statistical Process Control has or will be applied, the supplier shall complete a process capability study for each key characteristic. The capability will include at least 30 parts that have been consecutively run. When purchase order quantities do not allow the use of 30 parts, contact Purchasing/Supplier Quality Engineer at DRS for the agreed upon number used for the sample. THE PROCESS HAS TO BE IN STATISTICAL CONTROL. The study must demonstrate a minimum Cpk of 1.33 or greater for production capability. In the event that process capability is not demonstrated for key characteristics, these features shall be 100% inspected. Once demonstrated, the feature can be reduced to a valid sampling plan.

- **Inspection Data and Statistical Capability Reports**

- Lot Inspection data and associated lot statistical capability study reports shall accompany each delivered production lot with the shipping documentation. The data shall be delivered on CD or electronic storage media that states: “INSPECTION RECORDS”
- The data shall be delivered in an envelope that states: “INSPECTION RECORDS”. Electronic storage media may accompany the documented data. Failure to comply with these requirements shall be cause for lot rejection.

### **QC338 – Failure Mode & Effect Analysis Requirements:**

Early in the program's preliminary design phase, the hardware developer is required to identify specific reliability concerns and the steps being taken to mitigate them. The hardware developer is required to conduct either a Concept, Design or Process Failure Modes and Effects Analyses (FMEAs) to a sufficient level of detail that mission critical failures are identified and dealt with effectively. DRS form 376 shall be used to ensure consistent application of FMEA concepts.

FMEA results will be reported to the buyer as defined within the Purchase Order. The supplier shall complete a FMEA for the items produced and furnished as part of the purchase order. There are three categories of FMEAs that may be required. The supplier shall conduct the FMEA that applies according to the A, B and C selections

below. The letter after the QAC number will identify the type of FMEAs requested on this contract and is based on the description of work performed as follows:

- **Concept Failure Mode and Effects Analysis (CFMEA):**
  - The CFMEA shall be performed if the supplier of product(s) is the design agent of the item. The CFMEA is used to analyze concepts for systems and subsystems in the early stages of design and conception.
  - The CFMEA focuses on potential failure modes associated with the proposed functions of a concept proposal caused by design decisions that introduce deficiencies -- these include design decisions about the process layout. The CFMEA also include the interaction of multiple systems and the interaction between the elements of a system at concept stages (this may also be operation interaction in the process). CFMEA should be updated and resubmitted whenever a design change occurs.
- **Design Failure Mode and Effects Analysis (DFMEA):**
  - The DFMEA shall be performed if the supplier of product(s) is the design agent of the item. The DFMEA is used to analyze products before they are released to production. DFMEAs identify failure modes caused by design deficiencies and are used to identify Critical to Quality features or characteristics (CTQs) DFMEA should be updated and resubmitted whenever a design change occurs.
- **Process Failure Mode and Effects Analysis (PFMEA):**
  - The PFMEA shall be performed by the supplier that manufactures or produces the items to this order. The PFMEA is used to analyze manufacturing and assembly processes. The PFMEA focuses on:
    - Potential product failure modes caused by manufacturing &/ or assembly process deficiencies.
    - Confirms the need for Special Controls in manufacturing.
    - Confirms the identification of Critical to Quality features or characteristics (CTQs).
    - Identify process failure modes that could violate government regulations, compromise user health or safety.
    - Identifies processes requiring error proofing to reduce process variability.
  - PFMEA should be updated and resubmitted whenever a process escape or issue is found at DRS.

#### **QC339 – SPC:**

Supplier will develop and maintain an SPC Program approved by DRS.

#### **QC340 – Notification of Changes Alternate:**

*This QC Clause supersedes QC122 (Notification of Changes) with alternate methodology as described within.*

The item(s) described on buyer drawing is the only configuration approved by DRS. The seller shall provide written notification to the buyer prior to manufacturing of any changes from the following list:

- Manufacturing locations
- Changes in key suppliers
- Quality Management System



- Quality Management Personnel
- Ownership & Executive Management
- Machines & Equipment changes

This includes but is not limited to supplier owned design items where design is created from buyer's specifications. The supplier is responsible to communicate this requirement to any and all sub-tiers. To submit change requests, contact your DRS buyer. Suppliers are encouraged to submit change requests to improve quality, reliability and process capability, as well as reducing costs and lead- times.

A documented request for change shall be submitted to the Buyer 30 days prior to plan implementation. The change will not be implemented unless approved by DRS.

**QC341 – Packaging of Optical Components:**

Optical products shipped under this contract shall be individually packaged and protected from contamination and damage per drawing specification or using equivalent alternate packaging. Methods of alternate packaging may include lens tissue, cotton bags, membrane boxes, plastic boxes with molded inserts, etc. Individual packages shall be labeled with DRS part number, revision level, purchase order number, lot number and/or serial number if applicable, and shipping date.

**QC342 – Lot Control:**

Products supplied under this Contract shall be identified by the manufacturing lot, or batch number. If it is not practical to stamp individual products due to size or shape, the lot or batch number shall be stamped on identifying tags. All accompanying documents, such as packing list or certifications, shall include lot control number.

**QC343 – Charge Back:**

DRS reserves the right to charge back for incurred costs due to supplier non-conformance.

**QC344 – IPC/EIA J-STD 001, Class 3, Hand Soldering Approval / Certifications by Lockheed Martin:**

DRS Suppliers performing Class 3 hand soldering must be approved by Lockheed Martin representatives and must be listed as an approved special process supplier at the supplier gateway website; [supplier.external.lmco.com](http://supplier.external.lmco.com). (Cert Code PWA as a minimum) It is the supplier's responsibility to retain J-STD-001, Class 3, Hand Soldering Lockheed Martin certification as a condition for accepting this purchase order. A survey by Lockheed Martin must be performed every two years unless an extension is granted by Lockheed Martin. Any DRS supplier utilizing a sub-tier supplier for Class 3 hand soldering must also be surveyed. The DRS supplier must perform the survey and provide a copy to DRS Procurement. A Certificate of Conformance must accompany each lot of material.

**QC345 – PS CCA Changes:**

Process changes pertaining to CCA cleaning, hand soldering or impedance testing cannot be implemented without written permission from the DRS Quality Manager for the Apache Program.

**QC347 – Obsolescence:**

Suppliers of Circuit Card Assemblies are required to inform DRS of component availability risk discovered at any time during the performance of this contract. Notice, Impact, and recommendations are expected to be communicated no more than 10 days from discovery through the DRS Buyer or equivalent method. The supplier shall notify DRS of any End of Life, Obsolescence or Form, Fit, or Function issues for ten (10) years beyond the award date of the purchase order.

**QC348 – Restriction of Hazardous Substances (RoHS):**

The processes used and product supplied to this purchase order shall be RoHS compliant per the EU directive on the restriction of the use of certain hazardous substances, by not exceeding the specified limits of those hazardous substances, as contained in the latest directive and decisions (revisions).

A statement of RoHS compliance is required for all deliveries.

**QC349 – REACH:**

The supplier shall select materials and processes so that Substances of Very High Concern (SVHC) above the acceptable maximum threshold according to the latest version of Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) are not used or incorporated into the product.

If the products and/or materials furnished hereunder contain any REACH/SVHC substances, Seller must:

- Assure that those REACH/SVHC substances are properly registered (as defined in the COMMISSION REGULATION (EC) No 552/2009).
- Provide the relevant Safety Data Sheets (SDS) sheets for those substances.

**QC350 – Ozone Depleting Substances:**

Supplier shall also label products or materials which contain or are manufactured with ozone- depleting substances. "Ozone depleting substance", as used in this clause, means any substance the Environment Protection Agency designates in 40CFR Part 82 as Class I (including, but not limited to chlorofluorocarbons, halons, tetrachloride, and methyl chloroform), or Class II (including, but not limited to hydro chlorofluorocarbons).

Warning Contains (or manufactured with, if applicable) \* \_\_\_\_\_, a substance(s) which harm(s) public health and environment by destroying ozone in the upper atmosphere. "Ozone depleting substance" means any substance the Environment Protection Agency designates in 40CFR Part 82 as Class I (including, but not limited to chlorofluorocarbons, halons, tetrachloride, and methyl chloroform), Class II (including, but not limited to hydro chlorofluorocarbons) or any similar substance designated in European regulation (EC) No. 1005/2009 concerning ozone depleting substances ("ODS").

\* The Contractor shall insert the name of the substance(s).

**QC351 – Environmental Management System:**

The seller shall maintain an Environmental Management System that complies with the requirements of ISO 14001 (formal recognition by an accredited registrar is preferred.)

**QC352 – Responsible Waste Practices:**

The supplier shall ensure that hazardous wastes are disposed of in an environmentally responsible manner. Disposal of hazardous wastes should be controlled and delegated to specialized hazardous waste disposal firms with established Environmental Management Systems (EMS), based on ISO14001.

**QC353 – GIDEP:**

The contractor shall participate in the Government-Industry Data Exchange Program (GIDEP) in accordance with the requirements of the GIDEP S0300- BT-PRO-010 and S0300-BU-GYD-010, available from the GIDEP Operations Center, P.O. Box 8000, Corona, California 91718-8000. The contractor shall review all GIDEP ALERTS, GIDEP SAFE-ALERTS, GIDEP Problem Advisories and GIDEP Agency Action Notices to determine if they affect the contractor's products/services provided to the customer.

For those that affect the program, the contractor shall take action to eliminate or mitigate any Negative effect to an acceptable level. The contractor shall generate the appropriate failure experience data report(s) (GIDEP ALERT, GIDEP SAFE-ALERT, GIDEP Problem Advisory) whenever failed or nonconforming items, available to other buyers, are discovered during the course of the contract.

Suppliers shall not deliver product that contains material that are subject to a GIDEP alert.

**QC354 – Software Development Plan:**

The seller shall create a software development plan (SDP) that complies with DRS PCT document OQI-DD-301, or IEEE 1058-1998. This SDP must be reviewed and approved by DRS PCT prior to commencement of software development activities.

**QC354.1 – Software Development Plan – NIS Special Requirements:**

The supplier shall establish a software development program consistent with contract/engineering requirements as defined herein. The supplier shall ensure that the software development program plan provides independent assessment of software products and identifies activities which include all phases of the software lifecycle including:

- Requirements definition
- Software design concept
- Code development and integration
- Verification and validation Testing
- Code release
- Installation / checkout.
- Operational performance

The supplier shall document and implement procedures relating to the establishment, maintenance, and control / production of software products. The procedures shall address revision control, build, testing, release, media reproduction, archiving, environmental control, and virus protection. A disaster recovery process shall be defined and implemented.

The supplier shall document and implement a software configuration management process which addresses; configuration identification, baseline and traceability, change control, peer review, problem reporting and resolution, archive, retrieval, and release.

Preferred suppliers will be registered to ISO 90003 or equivalent internationally recognized Quality Management System.

**QC355 – Software Configuration Management:**

The seller shall employ a configuration management (CM) system that ensures all versions of all software deliverables are maintained and reproducible. This CM system shall ensure that all work products are defined and shall track and control changes to those work products.

**QC356 – Software Reviews:**

All software deliverables (defined in the SDP) are subject to review and approval by DRS PCT. A software requirements review shall occur prior to commencement of software design activity. A design review shall occur prior to commencement of implementation (coding) activity. The seller shall support and participate in all reviews.

**QC357 – Software Audits:**

The Seller's quality system and all software development activities are subject to periodic and random audits by the Buyer or Buyer's representative.

**QC358 – Painted Parts (NIS):**

Painted parts and assemblies must meet the requirements of ASTM 3359 and meet or exceed the visual criteria of 4B.

**QC359 – Lead Free Control Plans:**

Supplier shall document and utilize a Lead-Free Control Plan. This plan assures that its deliverable electronics products will satisfy the applicable requirements for performance, reliability, and safety throughout the specified performance life. This requirement shall also be flowed down to all electronic sub-tier suppliers. Reference Zinc, Silver or other pure metal whisker forming materials are not covered in this document.

**QC360 – AS6174 Counterfeit Materiel: Assuring Acquisition of Authentic and conforming Material:**

Supplier will conform to AS6174 in the event that no electronic (EEE) materials are available from the OEM, OCM or authorized franchised distributor.

**QC360.1 – Counterfeit Material: Assuring Acquisition of Authentic conforming Material: - Fitchburg:**

The Seller must represent and warrant that only new and authentic components, subcomponents, parts, material, and supplies are procured, used, incorporated into, and/or delivered in performance of this purchase order. No other material, part, or component other than a new and authentic part is to be used unless approved in advanced by the Buyer.

Seller agrees and shall ensure that counterfeit parts are not delivered to Seller or designee. The intentional or unintentional use, incorporation, or delivery of counterfeit parts is strictly prohibited. This includes it being provided either as an end item deliverable or as a component/subcomponent of an end item deliverable under this contract.

The Seller shall maintain a system or method of item traceability that ensures tracking of the supply chain back to the original equipment manufacturer (OEM) of all parts, assemblies and subassemblies being delivered per this purchase order.

Seller shall immediately notify Buyer in writing if Seller or sub-tier supplier cannot purchase or acquire authentic components, subcomponents, parts, material, and supplies directly from the OEM or through an OEM authorized distributor.

Upon identification of counterfeit material, the seller shall:

- Identify part(s) as nonconforming,
- Not return parts, but quarantine, and
- Report part(s) to GIDEP

#### **QC361 – Gold Embrittlement of Electronic components:**

Gold plating on all surfaces that become part of finished solder connections shall be removed by two or more successive tinning operations (solder pot or iron), or by other processes demonstrated to have equivalent effectiveness. Protective measures shall be taken to minimize component heating or prevent thermal shock (e.g., heat sink, thermal shunt, preheat) for all components identified as heat sensitive.

#### **QC362 – False, Fictitious and Fraudulent Statements:**

Seller must agree to include the following statement preprinted on each manufacturing, inspection or test record used in conjunction with the subject subcontract:

**Note:** *The recording of false, fictitious, or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute.*

#### **QC363 – Control of Coating Quality Records – Melbourne, FL; Dallas, TX:**

The following documents/items shall be maintained as a quality record and provided upon request:

- **Optical Coating Scans:** Optical coating scan shall be completed on a sample made of the same substrate material and with the same incident angle as it is required per the engineering drawing for the part. The highest resolution scale shall be used, with the scale identified and legible. One copy of the optical coating scan for each coating run is required to be included with the associated shipment. The scan shall reference contract number, part number with revision level and lot coating run number.
- **Optical Coating Witness Test Samples:** A minimum of one (1) witness sample for transmission and reflection of corresponding material type shall be processed along with each production coating run. The witness sample shall be identified and traceable to each coating run. (A witness sample must be produced and available for each coating run not each deliverable lot.) If multiple lots are shipped under the same coating run, the shipping documentation, or the certificate of compliance, shall be traceable to the original coating run. Witness samples from First Article/Qualification Lot: (1) ones that are not exposed to ESS (“virgin”), and another that are exposed to all ESS requirements, shall be included with the FA inspection documentation in the FA shipment.
- **Laser damage resistance certification testing:** If LDT is required per specification than supplier shall perform a laser damage resistance test in accordance with the specifications. The results of the laser damage resistance test shall be included in

the first article inspection documentation. Certification stating that shipped product meets laser damage resistance requirements shall be provided for each lot to DRS upon request. New damage resistance qualification test shall be performed and provided to DRS when any change in the coating process or material type occurs.

#### **QC364 – Contractor Requirements – Fitchburg:**

All Contractors performing work on site at DRS-PTI will be subject to clearance checks, which will include but may not be limited to a background check and verification of their U.S. Citizenship status. Clearance checks will be performed by DRS-PTI prior to commencement of work. For proof of U.S. Citizenship, Contractors should bring a copy of their passport or birth certificate and present it upon check in at DRS-PTI. IF THE CONTRACTOR is a NON-U.S. CITIZEN, DRS-PTI MUST BE NOTIFIED IN WRITING (PAPER OR E-MAIL) PRIOR TO ACCEPTANCE OF THE PURCHASE ORDER. A NON-U.S. CITIZEN WILL REQUIRE A DRS-PTI ESCORT AT ALL TIMES.

Also, NO CAMERAS or CELL PHONES WITH CAMERAS are allowed on the DRS-PTI Site. If pictures are required for documentation or conformance, please notify buyer. The buyer will arrange DRS-PTI personnel to take pictures with an authorized camera.

Prior to performing any work, awarded Contractors must comply with the following requirements:

1. DRS Power Technology, Inc. is an ISO-14001 (Environmental Management) certified company. Contractors are required to support the facility's program by supplying Material Safety Data Sheets for all chemical products needed on-site and to insure proper packaging and handling of those chemicals.
2. At their first visit, Contractors must complete the EHS contractor safety training; please let your point of contact know whether you have completed the contractor safety training for the current calendar year so they can make arrangements if needed.
3. The Contractor is required to provide a current certificate of insurance with DRS Power Technology, Inc., identified as the certificate holder before commencement of work. This is required every time a new job is awarded, and it will be kept on file with the purchase order.

#### **QC365 – GE Environmental Stress Screening (ESS) – Fitchburg:**

Per the applicable GE specification M50TFxxxx listed under Note 1 of the GE drawing, an Environmental Stress Screening (ESS) Test Report shall be submitted to DRS-PTI Buyer and Supplier Quality Engineer prior to shipment of product for review and approval. Once approved the seller shall include a copy of the test report with the product when shipped.

#### **QC366 – Material/Product Conformance:**

Seller's delivery of items under this Purchase Order shall be deemed as Seller's certification that such items meet and conform to all requirements of the Purchase Order including but not limited to any and all specifications, drawings, samples or other descriptions furnished or adopted by Buyer. In any case, documented evidence that delivered items conform to all requirements of the Purchase Order shall be on file at the Seller's Facility for a minimum of five (5) years from date of final acceptance or longer (if specified by the Purchase Order), and available for review upon request.

This Note does not relieve the Seller from submitting certifications and data required by Purchase Order Special Line Item Text and other Special Quality Notes.

**QC367 – Electronic, Electrical, Electromechanical (EEE) Part Lot Conformance Testing:**

**QC367.1 – Constructional Analysis – 5 Piece:**

Product supplied to this Purchase Order shall have a five (5) piece random sample subjected Constructional Analysis (CA) completed in accordance with ECSS-Q-ST-60-013. The CA shall be performed on product that has successfully completed all additional screening and conformance testing and be performed by an independent third-party test lab.

Significant quality issues surfaced during the Constructional Analysis process can cause the purchased item on the Purchase Order to be rejected.

**QC367.2 – Destructive Physical Analysis (DPA) - 1 Piece:**

Product supplied to this PO shall have a one (1) piece sample DPA completed on each production lot in accordance with MIL-STD-1580. DPA testing shall be done on product that has successfully completed all additional screening. DPA testing shall be performed by an independent third-party test lab.

Significant quality issues surfaced during the Destructive Physical Analysis process can cause the purchased item on the Purchase Order to be rejected.

**QC367.3 – Destructive Physical Analysis (DPA) - 2 Piece:**

Product supplied to this PO shall have a two (2) piece sample DPA completed on each production lot in accordance with MIL-STD-1580. DPA testing shall be done on product that has successfully completed all additional screening. DPA testing shall be performed by an independent third-party test lab.

Significant quality issues surfaced during the Destructive Physical Analysis process can cause the purchased item on the Purchase Order to be rejected.

**QC367.4 – Destructive Physical Analysis (DPA) - 3 Piece:**

Product supplied to this PO shall have a three (3) piece sample DPA completed on each production lot in accordance with MIL-STD-1580. DPA testing shall be done on product that has successfully completed all additional screening. An independent third-party test lab shall perform DPA testing.

Significant quality issues surfaced during the Destructive Physical Analysis process can cause the purchased item on the Purchase Order to be rejected.

**QC367.5 – Destructive Physical Analysis (DPA) - 5 Piece:**

Product supplied to this PO shall have a five (5) piece sample DPA completed on each production lot in accordance with MIL-STD-1580. DPA testing shall be done on product that has successfully completed all additional screening. An independent third-party test lab shall perform DPA testing.

Significant quality issues surfaced during the Destructive Physical Analysis process can cause the purchased item on the Purchase Order to be rejected.

**QC367.6 – Simple Destructive Physical Analysis (DPA) - 1 Piece:**

Product supplied to this PO shall have a 1-piece sample simple DPA completed on each production lot in accordance with AS6171/4. The photos and results will be sent to DRS. DPA testing shall be done on product that has successfully completed all additional screening. An independent third-party test lab shall perform DPA testing.

Significant quality issues surfaced during the Destructive Physical Analysis process can cause the purchased item on the Purchase Order to be rejected.

**QC367.7 – Coupled Surface Acoustic Microscopy (CSAM):**

Product supplied to this PO shall have 100% CSAM testing performed in accordance with J-STD-035. An independent third-party test lab shall perform the CSAM testing.

Parts failing CSAM testing shall be removed from the purchased part lot. Significant fallout of parts can cause the lot to be rejected.

**QC367.8 – Particle Impact Noise Detection (PIND):**

Product supplied to this PO shall have 100% PIND testing performed in accordance with MIL-STD- 883, method 2020, condition A or B. An independent third-party test lab shall perform the PIND testing.

Parts failing PIND testing shall be removed from the purchased part lot. Significant fallout of parts can cause the lot to be rejected.

**QC367.9 – Radiographic Inspection (XRAY):**

Product supplied to this PO shall have 100% radiographic inspection performed in accordance with MIL-STD-883, method 2012, in horizontal and vertical axes.

Parts failing radiographic inspection shall be removed from the purchased part lot. Significant fallout of parts can cause the lot to be rejected.

**QC367.10 – Residual Gas Analysis (RGA) – 1 or 3 Piece(s):**

Product supplied to this Purchase Order shall have a 3-piece sample RGA completed on each production lot in accordance with MIL-STD-1580B. If the product being procured is a MIL-PRF-19500 or MIL-38535 JANS or QMLV (space level product), it will only be necessary to do a 1-piece sample RGA test.

RGA testing shall be done on product that has successfully completed all additional screening. An independent third-party test lab shall perform RGA testing. RGA samples are not to be used for DPA testing.

**QC367.11 – High Humidity/Low Voltage Bias Testing (5 pieces for test + 1 piece for control):**

The supplier shall complete a 5-piece sample Steady State, Low Voltage Humidity test on each lot supplied to DRS TCL in accordance with MIL-PRF-123, paragraph 4.6.16.1. One sample will be used as a control sample.

**QC368 – Data Deliverables for Space Programs:**

Materials furnished for fulfillment of this Purchase Order shall have data deliverables as detailed below.



**QC368.1 – Group A data:**

The supplier shall provide Group A data with each shipment. The Group A data provided shall be compliant to the requirements of the controlling procurement specification or military standard.

**QC368.2 – Group B data:**

The supplier shall provide Group B data with each shipment. The Group B data provided shall be compliant to the requirements of the controlling procurement specification or military standard.

**QC368.3 – Group C data:**

The supplier shall provide Group C data with each shipment. The Group C data provided shall be compliant to the requirements of the controlling procurement specification or military standard.

**QC368.4 – Group D data:**

The supplier shall provide Group A data with each shipment. The Group D data provided shall be compliant to the requirements of the controlling procurement specification or military standard.

**QC368.5 – Group E data:**

The supplier shall provide Group A data with each shipment. The Group E data provided shall be compliant to the requirements of the controlling procurement specification or military standard.

**QC369 – Prohibited Materials for Space Programs:**

Materials furnished for fulfillment of this Purchase Order shall not contain the following materials unless the DRS buyer in advance of shipment has approved a waiver to these requirements.

1. Cadmium plating (sublimation and whisker risk)
2. Zinc plating (sublimation and whisker risk)
3. Pure tin plating or internal materials (whisker/pest risk, tin sublimation and arcing risk). Tin alloys with greater than 97% tin content are prohibited.
4. Pure beryllium or beryllium oxide (health hazard) on external surfaces
5. Silver is prohibited as a plating on printed wiring boards, terminal boards and bus bars (dendritic growth risk)
6. Packaging materials (e.g., bags, bubble wraps, trays, bottles, foam, connector caps, etc., contamination risk) made of Pink Polyethylene is prohibited from use in any form in the delivery of products supplied.

**Note:** This requirement does not apply to franchised distributors of Original Component Manufacturers (OCM) selling unmodified commercial of the shelf components (e.g., capacitors, resistors, transistors etc. purchased to an OCM data sheet). It is preferable that original manufacturer's packaging be retained when franchised distributors ship products to DRS.

**QC370 – Data Retention Requirements for Space Programs:**

Materials furnished for fulfillment of this Purchase Order shall have records pertaining to design, quality, procurement, test, fabrication, assembly, storage, and acceptance stored by the supplier for a period of time.

**QC370.1 – Data Retention Requirements for Space Programs – 7 Years:**

The supplier and their sub-tier suppliers shall maintain and store records pertaining to design, quality, procurement, test, fabrication, assembly, storage, and acceptance for a minimum period of 7 years and shall be made available to DRS TCL upon request.

If this requirement cannot be met, the supplier shall send the records as part of the shipment in electronic form on a readable storage media.

**QC370.2 – Data Retention Requirements for Space Programs – 10 Years:**

The supplier and their sub-tier suppliers shall maintain and store records pertaining to design, quality, procurement, test, fabrication, assembly, storage, and acceptance for a minimum period of 10 years and shall be made available to DRS TCL upon request.

If this requirement cannot be met, the supplier shall send the records as part of the shipment in electronic form on a readable storage media.

**QC370.3 – Data Retention Requirements for Space Programs – 15 Years:**

The supplier and their sub-tier suppliers shall maintain and store records pertaining to design, quality, procurement, test, fabrication, assembly, storage, and acceptance for a minimum period of 15 years and shall be made available to DRS TCL upon request.

If this requirement cannot be met, the supplier shall send the records as part of the shipment in electronic form on a readable storage media.

**QC370.4 – Data Retention Requirements for Space Programs – 20 Years:**

The supplier and their sub-tier suppliers shall maintain and store records pertaining to design, quality, procurement, test, fabrication, assembly, storage, and acceptance for a minimum period of 20 years and shall be made available to DRS TCL upon request.

If this requirement cannot be met, the supplier shall send the records as part of the shipment in electronic form on a readable storage media.

**QC371 – Product Freshness for Space Programs:**

Materials furnished for fulfillment of this Purchase Order shall have been manufactured in the period stipulated.

**QC371.1 – Product Freshness for Space Programs – 18 Months:**

Product supplied under this Purchase Order shall have Date or Lot Codes no older than 18 months at the time of shipment to DRS TCL. The DRS buyer may only approve waivers to this requirement in advance.

**QC371.2 – Product Freshness for Space Programs – 3 Years:**

Product supplied under this Purchase Order shall have Date or Lot Codes no older than 3 years at the time of shipment to DRS TCL. The DRS buyer may only approve waivers to this requirement in advance.

**QC371.3 – Product Freshness for Space Programs – 4 Years:**

Product supplied under this Purchase Order shall have Date or Lot Codes no older than 4 years at the time of shipment to DRS TCL. The DRS buyer may only approve waivers to this requirement in advance.

**QC371.4 – Product Freshness for Space Programs – 5 Years:**

Product supplied under this Purchase Order shall have Date or Lot Codes no older than 5 years at the time of shipment to DRS TCL. The DRS buyer may only approve waivers to this requirement in advance.

**QC371.5 – Product Freshness for Space Programs – 10 Years:**

Product supplied under this Purchase Order shall have Date or Lot Codes no older than 10 years at the time of shipment to DRS TCL. The DRS buyer may only approve waivers to this requirement in advance.

**QC372 – Hot Solder Dip:**

After completion of all tests the supplier shall perform a Hot Solder Dip of all parts in the lot. This shall be done per MIL-STD-19500, Paragraph H.4.3 and Table H-1 for discrete semiconductors, or per MIL-PRF-38535 Appendix A, paragraphs A.3.5.6.3.2 and A.3.5.6.3.4 for microcircuits.

**QC373 – Radiation Lot Acceptance Testing****QC373.1 – Radiation Lot Acceptance Testing – Total Ionizing Dose (for L3ETI):**

Parts supplied to this requirement shall be subjected to Total Dose radiation testing per L3-ETI drawing B850912.

**QC373.2 – Radiation Lot Acceptance Testing – Enhanced Low Dose Rate Sensitivity (for L3ETI):**

Parts supplied to this requirement shall be subjected to Low Dose radiation testing per L3-ETI drawing B850913.

**QC374 – Chemical Validation of Metal Surface Finishes (e.g., Paints, Primers, etc.):**

The supplier shall perform a chemical analysis of one representative sample of each unique lot of each delivered part of the items being supplied to this purchase order to evaluate the elemental breakdown of the paints being used on the supplied product. The supplier shall confirm that no substances have been used that would violate any material restrictions identified on this PO and/or any controlling documents for the supplied product.

Accepted methods to do this analysis are:

1. XRF testing of the material. The XRF will be done on a piece sample per part number per box. Should the material have more than one type of coating, each unique coating shall be tested. The XRF results shall include the:
  - a. data and time of the test
  - b. the test profile/program used
  - c. DRS part number and it's revision
  - d. DRS PO number and applicable PO line

- e. Identification of the person doing the test (stamp or signature)
- 2. Supplying paint chip(s) representing the different painted surfaces
- 3. Supplying the MSDS of all the constituent materials used

The C of C should state that the supplier has complied with the material requirements as covered by this clause, as well as a copy of the analysis report(s) shall be supplied with the shipment of the product.

**QC375 – Shelf Life Sensitive Batteries:**

Product that is susceptible to degradation with age must be marked indicating the date at which critical life was initiated and/or when the useful life will be expended. Upon receipt at DRS TCL the remaining shelf life of age sensitive material must be at least 90% upon receipt at DRS TCL.

As a minimum, the material or documentation shall contain the following information:

Part Number: \_\_\_\_\_ Part Name: \_\_\_\_\_  
 Manufacturer Name: \_\_\_\_\_ Unit of Measure: \_\_\_\_\_  
 Lot/Batch Number: \_\_\_\_\_ Shelf Life Exp. Date: \_\_\_\_\_  
 Manufacture Date: \_\_\_\_\_

**QC376 – Single Lot Date Code:**

Product supplied under this purchase order shall be of a single lot date code only. Multiple date codes must be preauthorized by the DRS buyer.

**QC376.1 – Product Traceability:**

All supplied product must be traceable back to the source of origin by lot/date code/batch number. This information shall be shown on the release documentation and package label(s).

**QC377 – Regulatory Certification of Conformance TSO-C123A:**

The supplier shall forward a certificate of compliance with each shipment stating that the items supplied have been manufactured and inspected and tested (as applicable) in accordance with the requirements of the purchase order and applicable drawings and specifications.

Product shipped to purchase orders referring to this quality clause shall also include a statement that the product complies with FAA technical standard order TSO-C123A. The supplier shall retain all applicable supporting documentation on file. This documentation shall make it available to DRS TCL upon request. All supplied product must be traceable back to the manufacturer. By supplying product to DRS (and submitting this C of C) the supplier is certifying that the product delivered was manufactured by the original source (manufacturer).

**QC377.1 – Regulatory Certification of Conformance TSO-C51A:**

The supplier shall forward a certificate of compliance with each shipment stating that the items supplied have been manufactured and inspected and tested (as applicable) in accordance with the requirements of the purchase order and applicable drawings and specifications.

Product shipped to purchase orders referring to this quality clause shall also include a statement that the product complies with FAA technical standard order TSO-C51A. The supplier shall retain all applicable supporting documentation on file. This documentation shall make it available to DRS TCL upon request. All supplied product must be traceable back to the manufacturer. By supplying product to DRS (and submitting this C of C) the supplier is certifying that the product delivered was manufactured by the original source (manufacturer).

### **QC378 - Process Validation (PVA) / Frozen Process (FP) - NIS**

Process Validation is a joint effort between the supplier and DRS.

The supplier shall complete Form 84-FRM-00-01, Supplier Process Validation – Frozen Process and include all applicable data elements that will be used during production of the material ordered under this purchase order.

On key characteristics where Statistical Process Control (SPC), has or will be applied, the supplier shall complete a process capability study for each key characteristic. The capability study will include at least 30 parts continuously run as one lot. If the purchase order quantity is less than 30 parts, DRS Purchasing and Supplier Quality Engineer/Supplier Engineering shall be contacted to determine the number of units to be used for the sample. The process must be in statistical control; the study must demonstrate Cpk of 1.33 or greater for production capability. In the event that process capability is not demonstrated for key characteristics, these features shall be 100% inspected. Once capability is demonstrated, the feature can be reduced to a valid sampling plan.

The purpose of the process validation is to “baseline” the supplier’s fabrication, assembly, inspection, and test processes, SPC implementation plan, and inspection/test points. Once validated, the process is considered “Frozen” and DRS must approve any changes prior to implementation. The supplier is responsible for submitting notification of Frozen Process change request via SAIR and including information and data concerning the proposal. The SAIR shall be submitted at least 15 days prior to the requested implementation date. Suppliers are encouraged to submit change requests to improve quality, reliability, and process capability, as well as reducing costs and lead-times. Changes include, but are not limited to, materials, processes, procedures, design, software, machines, location of manufacturing or sources of supply. These requirements apply to suppliers and to their sub-tier suppliers. The supplier is responsible to communicate this requirement to all relevant sub-tier suppliers.

Routine Process Verification. DRS will perform process verification on a routine basis to assess conformance to agreed process baseline.

### **QC379 – Digital Product Definition at Boeing Suppliers**

The supplier shall adhere to Boeing’s process specification D6-51991 (<https://www.boeing.com/suppliers/quality.html#/digital>), Quality Assurance Standard for Digital Product Definition at Boeing Suppliers. This includes DPD, MBD, and CMS/Metrology requirements outlined in D6-51991.

**QC380 – Advanced Product Quality Planning – Naval Electronics**

Suppliers to DRS Naval Electronics (NE) locations shall have a documented process detailing the planning and implementation of the manufacturing process against timing and product requirements using advanced product quality planning (APQP) concepts, such as those defined by Automotive Industry Action Group (AIAG) or AS9145, with the intent of mitigating identified risks towards a defect free product.

The supplier may leverage their internal Production Part Approval process to satisfy the requirements of this section with the concurrence from DRS. The default submission level for PPAP will be Level 3, unless specified by DRS, with the supplier assuming responsibility to update appropriate elements of the submission and determine use of previous level data in compliance with PPAP requirements.

Process control elements defined in this section shall be completed, submitted to DRS, maintained (i.e., updated, as applicable, for product engineering changes, process improvements, and/or non-conformance corrective actions), and retained by the supplier. The process control elements are as follows:

- Design Failure Mode Effects Analysis (DFEMA). Note: This only applies for suppliers who are responsible for or partnering with DRS on the product design.
- Process Flow Diagram
- Process Failure Mode and Effects Analysis (PFMEA)
- Key Characteristic Identification
- Process Capability Studies
- Control Plan
- Equipment Qualification (if applicable)
- Software Validation (if applicable)

Other process control elements for advanced product quality planning are such as measuring and test equipment analysis, packaging and labeling requirements, and first article inspections are defined by existing QC Codes.

**Failure Mode & Effect Analysis (FMEA) Requirements, Design/Process:**

Early in the program's design and/or manufacturing phase, the supplier is required to identify potential risks and the steps being taken to mitigate them. The manufacturer is required to perform a risk analysis of the design to the manufacturing process and identify mitigation plans for high risks using a FMEA methodology to complete a Design Failure Modes and Effects Analysis (DFMEA), as applicable, and Process Failure Modes and Effects Analysis (PFMEA). (Reference: AS9145, AS13004, Automotive Industry Action Group (AIAG) FMEA).

The supplier shall complete applicable DFEMA and/or PFMEA(s) for the items produced and furnished as part of the purchase order. The PFMEA(s) may apply to a group or family of products that are produced by the same process at the same source.

**Process Flow Diagram:**

The Process Flow Diagram (PFD) is a schematic representation of the sequence of operations required to manufacture the product from receipt of goods to shipment of finished product to the customer. This encompasses the movement of product internally from one-step to the next, as well as movement to and from external operations. It also

includes alternate processes i.e., different processes used to achieve the same output (e.g., backup equipment, secondary sources, etc.) that are intended to be qualified through first article samples.

The process flow diagram may apply to a group or family of products that are produced by the same process at the same source.

**Key Characteristics (sometimes referred to as Critical to Quality (CTQ)):**

Key characteristics are those product or process characteristics that are considered to have a significant impact on the form, fit or function of the part and/or influence customer perception of the end product. Key characteristics are those characteristics that are significantly impacted by the method of manufacture or have a significant impact on subsequent operations. Any Critical to Quality characteristics identified on a DRS drawing are to be considered as key characteristics.

Key characteristics shall be identified on related control plans, FMEA(s), FAIR, reports, and manufacturing process documentation.

Suppliers shall identify and communicate any known product or process Pass- Through Characteristics to DRS. Pass-Through characteristics are those that cannot be verified through the supplier's production process controls such that DRS operations or its end customer will be the primary party to evaluate the conformance/compliance of the identified product characteristic. Supplier shall implement and document 100% in-process verification control as a preferred methodology to ensure production hardware quality and conformity to key characteristics. The supplier may implement Statistical Process Control (SPC) techniques as an alternate methodology once the key characteristic is shown to have process capability.

**Key Characteristics – Use of SPC Process Capability:**

On key characteristics where Statistical Process Control (SPC) has or will be applied, the supplier shall complete a process capability study for each key characteristic.

- The study must demonstrate a minimum Cpk of 1.33 or greater for production capability (raw data reports shall be retained by the supplier and provided upon request from the receiving DRS site).
- In the event that process capability is not demonstrated for key characteristics, these features shall be 100% in- process inspected and documented. Once capability is demonstrated, the feature can be reduced to a valid sampling plan.

The capability study will include at least 30 parts that have been consecutively run. If projected volumes are so low that 30 samples are not attainable prior to production, the supplier shall implement and document 100% in-process inspection verification until 30 consecutive samples are produced, measured, and the capability calculated and accepted.

**Control Plan:**

This is a written description of the measures for controlling the variations in the production manufacturing process in order to provide a production part within the acceptable limits defined by the drawing and specification requirements and/or other DRS authorized flow down requirements. It is designed to be a key reference for the Operator within the process on what is required and is used alongside detailed Work Instructions / Process

Instructions. (Reference: AS9145 or Automotive Industry Action Group (AIAG) Control Plan).

All key and controlled characteristics shall be listed on the control plan.  
The control plan may apply to a group or family of products that are produced by the same process at the same source.