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# Common Supplier Quality Clauses SCM-004-FRM

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Leonardo DRS

## CHANGE HISTORY

Record of Changes			
Revision	Description	Date	Approval
	Initial Release as Corporate level document	01/11/2018	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	3/22/2018	Corporate Supplier Development Engineering

# Table of Contents

CHANGE HISTORY .....2

1.0 Purpose .....7

2.0 Introduction .....7

3.0 Process Owner.....7

4.0 Responsibility .....7

5.0 Stakeholders.....7

6.0 Referenced Documents .....7

7.0 Acronyms and Definitions .....8

8.0 Procedure for Using Clauses .....9

    8.1 Quality Clause Structure.....9

    8.2 Quality Clauses.....9

        QC100 - Quality Management System .....9

        QC101 – Identification, Preservation, Packaging, and Packing .....9

            QC101.1 – Identification, Preservation, Packaging, and Packing - Fitchburg, MA .....10

            QC101.2 – Identification, Preservation, Packaging, and Packing – St. Louis, MO .....11

            QC101.3 – Identification, Preservation, Packaging, and Packing – Milwaukee, WI; Dallas, TX; Melbourne, FL; Huntsville, AL .....11

        QC102 – Source of Supply .....13

        QC103 Measuring & Test Equipment .....13

        QC104 – Control of Quality Records .....13

            QC104.1 – Control of Quality Records – Fitchburg, MA .....14

        QC105 – Supplier Material Review Board (MRB) Authority .....14

        QC106 – Shelf Life .....14

        QC107 – Temperature Sensitive Material .....14

        QC110 – Notification of Non-conformances Responsibility .....14

        QC111 – Control of Lower-Tier Suppliers .....14

        QC112 – Supplier Corrective Action Request .....14

        QC113 – Certificate of Compliance, or Conformance (C of C) .....14

        QC114 – Parts Substitution .....15

        QC115 – Safety Data Sheet (SDS) .....15

        QC116 – Right of Access .....15

        QC117 – Mercury Prohibition .....16

            QC117.1 – Prohibited Materials – Danbury CT .....16

        Table 1: Prohibited Materials .....16

            QC117.2 –Asbestos Prohibited Materials Warning – Milwaukee .....17

        QC118 – Government, DRS or Customer Property.....17

        QC 119 DRS-Owned Tooling:.....17

        QC120 – Foreign Object Debris (FOD) Prevention and Part Cleanliness .....17

        QC121 – First Article Inspection .....17

QC122- Notification of Changes.....18

QC123 – Rejection of product using Sample Inspections .....18

QC124 – Drop-shipped Parts and Material.....18

QC 2XX Series Quality Clauses .....19

QC201 – Solderability .....19

QC202 – Electrostatic Discharge (ESD) Control.....19

QC203 – Printed Wiring Boards (PWBs).....19

QC203.1 – Printed Wiring Boards (PWBs): Rigid & Flex PWBs.....19

QC203.2 – Printed Wiring Boards (PWBs) Alternatively Detailed Special Requirements.....19

QC204.1 - Circuit Card Assemblies (CCAs) - Quality Procurement Requirements (QPR) for Danbury, CT .....20

QC205 – Wiring Harnesses.....20

QC206 – Rework/Repair Authorization of Circuit Card Assemblies.....20

QC207 – Moisture Sensitive Components .....20

QC207.1 – Moisture Sensitive Components - St Louis (SSI) Requirements.....21

QC208 – Magnetic Core Packaging Requirement.....21

QC209 – NDT Requirements for Die Castings.....21

QC210 – Special processes.....21

QC210.1 Certification of Special Processes – DRS managed approval .....21

QC210.2 Certification of Special Processes – Supplier managed approval .....21

QC210.3 Certification of Special Processes – Customer managed approval .....22

QC211 – Fastener Quality Assurance Requirement .....22

QC211.1 External Threaded Fastener Requirements (St. Louis).....22

QC221.1 – First Article Inspection – AS9102 and Balloon print requirement.....22

QC221.2 – First Article Inspection – Source Inspection Required .....23

QC221.3 – First Article Inspection – Specific requirements for Danbury CT .....23

QC221.5 – First Article Inspection at Source – Specific requirements for St Louis, MO .....24

QC221.6 – First Article Inspection - Desktop Review Requirement.....25

QC221.7 – First Article.....25

QC303 – Unique Identification (UID) marking requirements .....25

QC304 – Eye Examinations .....26

QC305 – Qualified Products List (QPL).....26

QC306 – Printed Wiring Boards (PWBs).....26

QC306.1 - Interconnect Stress Test (IST) Requirement.....26

Table 2. Test Parameters .....27

QC308 – Calibration Sub-contractor Requirements .....28

QC308.1 - Calibration Sub-contractor Requirements – Alternate Requirement.....28

QC309 – As-Built List (ABL).....28

QC310 – Flow Plan.....29

QC311 – Circuit Card Assembly (CCA) Test.....29

QC312 - Data Deliverables.....29

QC312.15 - Data Deliverables: Cable Harness Test Report.....31

QC312.16 - Data Deliverables: Circuit Card Assembly (CCA) Test.....31

QC312.17 – Data Deliverables .....31

QC319 – Source Inspection at Seller’s Facility .....31

QC319.1 – Source Inspection at Seller’s Facility – St Louis Special Requirements .....32

QC320 – Government Source Inspection (GSI).....32

QC321 – Machined Parts .....32

QC322 – Material Control System (MCS-6B).....33

QC323 – Critical Control Systems.....33

QC324 – Naval Nuclear Purchase Order Requirements .....33

QC325 – Commercial Nuclear Quality Assurance (NQA) .....38

QC326 – Quality Program Requirements (NQA) .....39

QC327 – Seal, Gasket, O-Ring, etc. (Newport News) .....39

QC330 – Returned Supplier Material.....40

QC330.1 – Returned Supplier Material .....40

QC330.2 – Returned Failure Analysis Report .....40

QC331 – Delegation of Verification (Designated Supplier Quality Representative) .....40

QC332 – Supplier Material Review Board (MRB) Authority Alternate .....41

QC333 – Age Control of Rubber Goods, SAE AMS 2817 / SAE ARP5316.....41

QC334 – Requirements for Casting (Test Bars) .....41

QC335 – WITNESS SAMPLES / COUPONS.....41

QC336 – MIL-PRF-22750 OR MIL-DTL-53039 OR MIL-DTL 64159 ORGANIC AND CHEMICAL RESISTANT (CARC) / SURFACE FINISHES .....41

QC337 – Supplier Process Control .....41

QC338 – Failure Mode & Effect Analysis Requirements .....42

QC339 – SPC .....43

QC340 Notification of Changes Alternate .....43

QC341 – Packaging of Optical Components .....44

QC342 – Lot Control.....44

QC343 – Charge Back .....44

QC344 - IPC/EIA J-STD 001, Class 3, Hand Soldering Approval / Certifications by Lockheed Martin .....44

QC345- PS CCA Changes .....44

QC347 – Obsolescence.....44

QC348 – Restriction of Hazardous Substances (RoHS) .....45

QC349 REACH .....45

QC350 Ozone Depleting Substances .....45

QC351 – Environmental Management System .....45

QC352 - Responsible Waste Practices .....45

QC353 – GIDEP .....45

QC354 – Software Development Plan.....46

QC354.1 Software Development Plan – NIS Special Requirements.....46

QC355 – Software Configuration Management .....46

QC356 – Software Reviews .....46

QC357 – Software Audits .....46

QC358 – Painted Parts (NIS).....47

QC359 – Lead Free Control Plans .....47

QC360 - AS6174 Counterfeit Materiel: Assuring Acquisition of Authentic and conforming Materiel .....47

QC361 – Gold Embrittlement of Electronic components .....47

QC362 – False, Fictitious and Fraudulent Statements .....47

QC363 – Control of Coating Quality Records – Melbourne, FL; Dallas, TX .....47

## **1.0 Purpose**

The purpose of this document is to identify common quality clauses used on Purchase Orders (POs) by Leonardo DRS facilities using this document, hereinafter referred to as DRS.

## **2.0 Introduction**

This procedure applies to all DRS sites and its suppliers. It is intended to establish common language for supplier quality requirements related to DRS generated POs.

## **3.0 Process Owner**

DRS Supplier Development Engineering

## **4.0 Responsibility**

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

It is the responsibility of the supplier to review all identified quality clauses and ensure compliance to the specified requirements (most current revision). When there is any confusion or conflict between identified clauses or other DRS documentation, then it is the supplier's responsibility to contact the DRS site buyer to resolve those issues prior to initiating work.

## **5.0 Stakeholders**

The stakeholders are the Quality and Supply Chain personnel at each DRS site who use these clauses.

## **6.0 Referenced Documents**

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

## 7.0 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 Points
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



## 8.0 Procedure for Using Clauses

### 8.1 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).*

### 8.2 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 D3951-10 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 our 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
- For any escalations, you can reach out directly to:
  - Daniel Dasari - 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
    - Provide the below broker information:

**Expeditors International of Washington:**

ATTN: Jocelyn Cote  
3 Technology Drive

Peabody, MA 01960  
Phone: 978.573.0001  
Fax: 978.573.3373  
Email: jocelyn.cote@expeditors.com

**Bill to Address:**

DRS Power Technology, Inc.  
166 Boulder Drive, Suite 20  
Fitchburg, MA 01420  
E-mail: 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 a corresponding 2D 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"
  - 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

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

(LABEL HEIGHT = 6" - LABEL BOX/TABLE HEIGHT = 5.8125")

**QC102 – Source of Supply:** See DRS T&C's Section 11. Suppliers are responsible to ensure compliance for materials used to manufacture parts supplied to DRS. Suppliers will only purchase materials from Original Equipment Manufacturers (OEMs), Original Component Manufacturers (OCMs) or the OEM/OCM authorized distributors. Purchasing from independent brokers or other sources is not authorized unless approved in writing by DRS.

Suppliers of electronic components shall have an established counterfeit avoidance program in compliance with SAE AS5553 Counterfeit Electrical, Electronic, and Electromechanical (EEE) Parts; Avoidance, Detection, Mitigation and Disposition & AS6081 Fraudulent/Counterfeit Electronic Parts: Avoidance Detection, Mitigation, and Disposition. Distributors of electronic components shall certify that franchise agreements and/or written OEM/OCM reseller authorization is on file for all parts provided.

For Broker part(s): if the required items cannot be procured from the OCM, or the OCM's Authorized Distributors, DRS approved Independent Distributors (Brokers) may be used after receiving specific written approval. The Supplier must present a complete test plan for each part being procured in compliance with AS6081 Fraudulent/Counterfeit Electric Parts; Avoidance, Detection, Mitigation, and Disposition - Distributors or CCAP101 Certification for Counterfeit Components Avoidance Program. The test plan must ensure the parts procured are functional and new authentic parts. This test plan must be approved by DRS and referenced on the subject PO. Test results must be maintained by the supplier and presented to DRS upon request.

Independent brokers must be AS6081 or CCAP101 compliant.

Supplier shall notify DRS when suspect counterfeit materials has been identified. (Reference QC-110) Notification of counterfeit or suspect counterfeit components shall be performed using the DRS Supplier Variation Request process. The Supplier shall not deliver products that contain counterfeit items, such as, but not limited to, software, material, and electrical/mechanical parts/assemblies.

Any suspect counterfeit parts delivered to DRS are considered non-conforming material and will be controlled per site requirements. Counterfeit parts will not be returned to the supplier and will 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. A calibration system in accordance with ISO 10012-1 Quality Assurance Requirements for Measuring and Test Equipment, ISO17025 Part 1 and Z540.3 Calibration Laboratories and Measuring and Test Equipment – General Requirements, or equivalent will be used by the supplier.

**QC104 – Control of Quality Records:** 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.

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; edits shall be noted with a single line-out; and changes must be annotated, minimally, with initials and date next to change. No ditto marks or continuation marks are allowed.

**QC104.1 – Control of Quality 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.

**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.

**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.

**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.

**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 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. 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".

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.

Distributors shall include the OEM Certs with the delivered item.

**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.

**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.

**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 – Danbury CT:** Unless specifically called out by DRS-CCI procurement documents or approved drawings, the materials listed in Table 1 shall not be used in the manufacture of items delivered to DRS-CCI. 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 DRS-CCI in writing prior to production and identify the type, location and amount of material to be used, refer to the SVR process per DQP-SP-052A. The notification shall include an evaluation of all alternatives considered.*

**Table 1: Prohibited Materials**

Adhesive Tape	Lithium
Aluminum Electrical Conducting Wire	Low Melting Point Metals
Antimony and Alloys	Magnesium
Asbestos	Mercury & Mercury Compounds (see QC117)
Barium	Ozone Depleting Substances
Bismuth and alloys	Polychlorinated Biphenyls (PCBs)
Boron Trifluoride	Polyvinyl Chloride (PVC)
Brass with Pb > 1%	Radioactive Materials
Bronze with Pb > 1%	Selenium
Cadmium	Silicone
Chromium & Chromium Compounds	Silver
Corrosion Inhibitors	Teflon



Flammable materials	Thermal compound (for electrical connectors and socket mounted components)
Fragile or Brittle materials	Thiosulfate
Freon solvents	Tin and alloys
Lead and alloys	Zinc, alloys and chromates
Liquid masking material (for electrical connectors and socket mounted components)	

**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.

**QC 119 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.

**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;

- As requested by DRS.

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 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.

**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.

## QC 2XX 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.

**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.

**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 all of the following are not provided:

- One coupon per panel is to be maintained by the supplier. (Reference QC104.)
- 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 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 (QPR) for Danbury, CT:** DRS QPRs for CCAs applies to material on the PO Contact DRS CCI Buyer for this document.

**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.

*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.

**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 any and 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.

**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. SAE 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. SAE 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.

**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 (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 has 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. Submit as a deliverable with Balloon Prints.

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 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. The following is also required to be submitted with the FAIR:

- Submit as a deliverable with Balloon Prints.
- Raw Material Certificate of Compliance for all specified materials
- Finish certificate of Conformance and / or Certificates of special process listed on the DRS-CCI drawing
- Component / Hardware Certificate of Compliance for each item on the Bill of Materials, includes COTS items
- Process Documentation and revision used to manufacture the item.
- PO requirements – Flow down of any specific requirements/instructions
- Certificate of Compliance,
- Test Report, if applicable
- Nonconformance or SVR approvals if applicable
- Engineering Changes or approvals if applicable
- Welding Inspection Records, if applicable

**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 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 shall be submitted to by email to:
  - FOR SHIP TO DESTINATION OF WEST PLAINS, MO. ( [SSIFAIR-WP@drs.com](mailto:SSIFAIR-WP@drs.com) )
  - FOR SHIP TO DESTINATION OF ST. LOUIS, MO. ( [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 shall be submitted to by email to:
  - FOR SHIP TO DESTINATION OF WEST PLAINS, MO. ( [SSIFAIR-WP@drs.com](mailto:SSIFAIR-WP@drs.com) )
  - FOR SHIP TO DESTINATION OF ST. LOUIS, MO. (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.
- Contact DRS SSI by e-mail at [sqastl@seistl.com](mailto:sqastl@seistl.com) for instructions prior to submitting supplemental FAIRs.
- 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 1<sup>st</sup> Article Report and receive approval by DRS prior to shipment.

### **QC 3XX 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 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.*

**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 ISO 10012-1 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.

**312.1 Data Deliverables: Non Destructive Test report** (X-Ray, Ultrasonic, Liquid Penetrant, Magnetic Particle)

**312.2 Data Deliverables: Critical Dimension Report.** The supplier shall provide a Critical Dimension report as specified in this Purchase Order.

**312.3 Data Deliverables: Full Dimension Report.** The supplier shall provide a Full Dimension report as specified in this Purchase Order.

**312.4 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.

**312.5 – 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.

**312.6 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.

**312.7 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.

**312.8 Data Deliverables: Certificate of Analysis (C of A):** C of A is required to accompany all materials supplied to an individual purchase order. Material, Chemical and Mechanical Reports.

- The C of A will include:
- Customer Name \*
- Manufacturer's name;
- Country of origin/melting/smelting;
- Specification number;
- Material grade;
- Material marking
- Material condition;
- Size;\*
- Heat lot, number;
- Heat Condition \*
- Date Code; \*
- Chemical analysis (Specification requirements and results);
- Physical properties applicable to the procured material (Specification requirements and results)
- (Indicates where applicable)

**312.9 Data Deliverables: Certification of Solderability.** The supplier shall perform Solderability testing as specified by this Purchase Order.

**312.10 Data Deliverables: Welding Certifications.** The supplier shall provide Welding Certifications as specified by this Purchase Order.

**312.11 Data Deliverables: Hydraulic Cleanliness.** The supplier shall provide Hydraulic Cleanliness reports as specified in this Purchase Order.

**312.12 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.

**312.13 Data Deliverables: Qualification Test Reports:** The supplier shall provide Qualification Test Reports as specified in this Purchase Order.

**312.14 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 off Special Processes. The supplier shall provide a Special Process Certification as specified in this Purchase Order.**

**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.SSIsqastl@drs.com](mailto:www.SSIsqastl@drs.com).

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

**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 slugs 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:

- "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):** 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.

## **5.0 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/IEC10725.17025 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.

**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 product 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 insure 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 ISO 14001.

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

**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, not each deliverable lot, is required. The scan shall reference contract number, part number with revision level and lot control number.

**Optical Coating Witness Test Samples:** A minimum of one (1) witness sample of corresponding material type shall be processed along with each 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.

**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.