



09492L00008
Revision W

GENERAL ATOMICS ELECTROMAGNETIC SYSTEMS

STANDARD QUALITY CLAUSES

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GA PROJECT 09492

Title: GA-EMS Standard Quality Clauses	Number: 09492L00008	Revision: W
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REVISION HISTORY

Revision	Date	Description of Change
A	2008/06/06	Initial Release
B - P	VARIOUS	Information found in Windchill
R	2017/01/05	Add clauses 248 and 249 and for consistency added "GA-" to the Title.
T	2017/12/22	Add 293a and 280b. Delete 201, 202, 254, 280a, as well as pre-approval requirement for 277. Revise document number for GA-ESI Note Codes. Clarify that various 213e deliverables must be submitted separately. Update NAVAIR contacts in 219/219a. Clarify 202a, 203, 213, 213ed, 214a, 249, 259, 273, 275, 280, 280a, 293 and 294. Modify Table 1 and Document Submittal Instructions. Modify Table 3 entries for 208, 213e(b), 213 e(d), 217, 217a, 231, 249a, 273, 275, 277, 280, 280a, 280b, 293, 293a. Converted 216 to 216a.
U	2018/05/30	Modified "Introduction." Modified Table 3 (removed 211, edited 249a, 258, 258a, 280 and 280b). Modified 221, 258, 258a, 259 and 280.
V	2018/10/19	Added definitions for MIBOM, QCM and QCM CSI to "Acronyms" table. Added reference to product safety in the "Introduction." Corrected "Deliverable" in Table 3, 213e(d). Added 259b to Table 3. Clarified 203, 259, 259b and 303. Removed "Prior to delivery ..." from 255, 256, 258, 258a, 259, 259b, 262, 263 and 300; moved guidance to "Data Submittal Instructions." Added 200, 218b, 247 and 289.
W	2019/08/14	Reformatted document structure and created appendices. Streamlined revision history and document content. Removed internal GA-EMS points of contact. Removed Table 3. Made revision-specific. Defined contractual terms and made consistent with GA-EMS Purchasing procedures and templates. Made terms consistent throughout document. Updated Non-GA-EMS Documents and Acronyms. Added new clauses: 213f, 800-805. Combined clauses 301/302/303 and consolidated under clause 200. Consolidated clauses 203, 204, 270, 297, under general clause 200. Consolidated clause 212a into 212. Clarified various clauses. Consolidated "IMPORTANT" note regarding document re-approval under new Section 3 preamble. Removed hardcoded NAVAIR GSI contact information.

COMMITMENT

Revision	Commitment No.	Number: Contract or Customer (Project)
A - T	N/A	(09492)
U	34619	(09492)
V	35500	(09492)
W	37800	(09492)

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1 PURPOSE/SCOPE

This document establishes the procurement quality requirements, which are applicable to the extent specified in the Order.

The following definitions apply to this document:

- “Buyer” means General Atomics (GA) or General Atomics Electromagnetic Systems (GA-EMS).
- “Order” means the purchase order or subcontract issued by Buyer to Seller.
- “Seller” means the person, firm, or corporation executing the Order with the Buyer and who will furnish the supplies or services provided for in the Order.
- “Item” means the works, supplies, articles, product, or services provided for in the Order.

Seller is responsible for compliance with all requirements specified in the Order. Any questions regarding quality requirements should be directed to Buyer’s Authorized Purchasing Representative specified in the Order. Seller is also responsible for ensuring this document is reviewed, applied during all phases of performance under the Order, and that all employees understand these quality requirements and are aware of their contribution to product or service conformity and product safety.

2 APPLICABLE/REFERENCE DOCUMENTS

Table 1 and Table 2 list the applicable reference documents, forms, and templates pertinent to Buyer’s procurement quality requirements management process.

Table 1. GA-EMS Documents

Doc. Number	Doc. Title
EMS-0196	Supplier Disposition Request
EMS-0282	Material Identification Code Mark Package Summary
EMS-0312	Supplier Release to Manufacture
EMS-0364	Data Reuse and Duplication Request From
EMS-0365	Welder Summary Table
49200P00002	Deliverable Documentation/Data Item Submittal Instructions
49200R00003	NAVAIR Source Inspection Points of Contact
GA 580	Quality Assurance Work Release

Table 2. Non-GA-EMS Documents

Doc. Number	Doc. Title
ANSI/ASQ Z1.4	Sampling Procedures and Tables for Inspection by Attributes for inspection of product/process defects
ANSI/ESD S20.20	Development of an Electrostatic Discharge Control Program for – Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)
ANSI/ISO/ASQ Q9001	Quality Management Systems – Requirements
ANSI/NCSL Z540.3	Requirements for the Calibration of Measuring and Test Equipment

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Doc. Number	Doc. Title
ANSI/NEMA WC 70/ICEA-S-95-658	Nonshielded Power Cables Rated 2000 Volts Or Less For The Distribution Of Electrical Energy
ASME-BPVC	American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code
AWS D1.1	Structural Welding Code – Steel
AWS D1.2	Structural Welding Code – Aluminum
AWS D1.3	Structural Welding Code – Sheet Steel
AWS D1.6	Structural Welding Code – Stainless Steel
AWS D9.1	Sheet Metal Welding Code
DD Form 250	Material Inspection and Receiving Report
DI-SAFT-81934	Process/Operations Sheets
IEEE 383-1974	IEEE Standard for Type Test of Class 1E Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations
IPC/WHMA-A-620	Requirements and Acceptance for Cable and Wire Harness Assemblies
IPC-6011	Generic Performance Specification for Printed Boards
IPC-6012	Qualification and Performance Specification for Rigid Printed Boards
IPC-6013	Qualification and Performance Specification for Flexible/Rigid-Flexible Printed Boards
IPC-A-610	Acceptability of Electronic Assemblies
IPC-D-640	Design and Critical Process Requirements for Optical Fiber, Optical Cable and Hybrid Wiring
IPC J-STD-001	Requirements for Soldered Electrical and Electronic Assemblies
ISO 10012-1	Measurement management systems – Requirements for measurement processes and measuring equipment
ISO/IEC 17025	General Requirements for the Competence of Testing and Calibration Laboratories
ISO/IEC/IEEE 90003	Software engineering – Guidelines for the application of ISO 90012015 to computer software
JEDEC EIA-625JESD625	Requirements for Handling Electrostatic-Discharge-Sensitive (ESDS) Devices
NAS-412	Foreign Object Damage Debris (FODD) Prevention
NAVSEA S9074-AR-GIB-010/278	Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels
NAVSEA S9074-AQ-GIB-010/248	Requirements for Welding and Brazing Procedure and Performance Qualification
PPD 802-7094539	N/A
SAE AS5553	Counterfeit Electronic Parts, Avoidance, Detection, Mitigation and Disposition
SAE AS6496	Fraudulent/Counterfeit Electronics Part: Avoidance Detection, Mitigation, and Disposition – Authorized/Franchised Distributors
SAE AS9102	Aerospace First Article Inspection Requirement
SAE JA 1000-1	Reliability Program Standard Implementation Guide
SNT-TC-1A	Personnel Qualification and Certification in Non-Destructive Testing

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3 QUALITY CLAUSES

This section contains Buyer's standard Quality Clauses.

Some Quality Clauses require one or more documents that must be approved by Buyer. All Supplier documents requiring Buyer approval shall not be modified after Buyer's approval without prior written re-approval by Buyer.

References to "DFARS" mean Defense Federal Acquisition Regulation Supplement (DFARS) clauses, which can be found at <https://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html>.

3.1 Quality Program

(200) General Quality Requirements

- 1) **DOCUMENTED INFORMATION**: Documented information is any relevant data Seller is required to control and maintain, as well as data Seller determines to be necessary for the effectiveness of its Quality Management System (QMS). Seller shall maintain documented information to the extent necessary to support the operation of processes. Seller shall retain documented information to the extent necessary to have confidence processes are being carried out. Seller shall ensure retention periods and disposition practices are in accordance with any applicable standards, unless otherwise specified in the Order. Seller shall ensure documented information of its sub-tier suppliers is maintained and retained sufficient to ensure compliance with this Quality Clause 200(1). Seller documented information and Seller's sub-tier supplier documented information shall be made available to Buyer and Buyer's customer(s), including Government and regulatory agency authorized representatives, upon request by Buyer at no additional cost.
- 2) **NOTIFICATION OF FACILITY CHANGE**: Seller shall not relocate any production, manufacturing, and/or processing facilities without prior written approval by Buyer. Seller shall request Buyer's written approval through the Supplier Disposition Request (SDR) process outlined in Quality Clause 221, herein, at least 30 days prior to the planned relocation. All such requests shall include a comprehensive relocation plan and clearly demonstrate no impact to the Order's schedule performance.
- 3) **SUB-TIER SUPPLIER CONTROL**: Seller shall control sub-tier supplier procurements to the extent necessary to ensure the requirements specified in the Order are satisfied. Such control includes, but is not limited to, ensuring all requirements necessary to ensure compliance are flowed to lower tier suppliers and that all deliverable items have been controlled, manufactured, tested and inspected in compliance with all requirements. Seller shall provide Buyer with copies of sub-tier procurement documents (e.g., purchase orders, subcontracts, contracts, etc.) upon request.

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- 4) **SELLER'S BASIC CERTIFICATE OF CONFORMANCE (CofC):** Acceptance of the Order indicates compliance to all requirements of the Order, including, but not limited to the following:
- a) Items furnished per the Order have been manufactured, tested, and inspected in accordance with the requirements of all applicable specifications/drawings and the results of such tests and inspections meet the requirements thereof.
 - b) Buyer and Government-required inspections and tests have been performed utilizing calibrated equipment.
 - c) All material used in deliverable items meet the applicable specification/drawing requirements specified by the Order.
 - d) Any specification requirements identified in support of the Order shall be done to the revision at the time of Order placement, including any applicable approved Engineering Change Notice(s) (ECNs), unless otherwise negotiated.
 - e) If a Supplier Disposition Request (SDR) was submitted and dispositioned, Seller shall add the SDR number(s) to the packing slip and provide a copy of the SDR with the shipment.
- 5) **RESPONSIBILITY FOR CONFORMANCE:** Neither surveillance, inspection and/or test made by Buyer or its representatives or United States (US) Government representatives at either Seller's or Buyer's facility, nor Seller's compliance with all applicable requirements, shall relieve Seller of the responsibility to furnish an item that conforms to the requirements of the Order.
- 6) **COUNTERFEIT PART PREVENTION:** Seller shall plan, implement, and control processes, appropriate to Seller's organization and the product, for the prevention of counterfeit or suspect counterfeit material/part use and their inclusion in the product delivered to Buyer. Seller's providing electrical/electronic/electro-mechanical (EEE) parts:
- Seller shall have a counterfeit detection process that meets the intent of SAE AS5553, "Counterfeit Electronic Parts, Avoidance, Detection, Mitigation, and Disposition," unless DFARS 252.246-7007 is specified in the Order. If DFARS 252.246-7007 is specified in the Order, Seller shall have a counterfeit detection process that meets the intent of DFARS 252.246-7007.
- As part of a counterfeit part prevention practice, Seller shall ensure that all electrical/electronic/electro-mechanical (EEE) parts being delivered to Buyer directly, or as part of a higher assembly, have been procured directly from an Original Equipment Manufacturer (OEM) or a first-tier OEM authorized distributor.

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Authorized distributor Sellers shall provide a CofC in accordance with SAE AS6496 and maintain a method of traceability that ensures tracking of the supply chain back to the OEM, including the CofC when available, and shall supply records of this traceability to Buyer upon request. OEM Sellers shall provide a CofC.

If Seller cannot procure an EEE part directly from the OEM or a first-tier OEM authorized distributor or provide traceability back to the OEM, Buyer's approval is required.

- 7) **ELECTROSTATIC-DISCHARGE-SENSITIVE DEVICES**: For electrical and electronic parts susceptible to damage from electrostatic discharge (ESD), Seller is responsible to establish and implement an ESD control program per JEDEC 625, ANSI/ESD S20.20 (latest revision) or equivalent. Seller shall take the necessary precautions to ensure static susceptible devices are adequately protected from ESD damage during manufacturing, test, inspection, packaging, and shipping. Packaging shall be marked with an ESD cautionary note or symbol.
- 8) **GOVERNMENT CORRECTIVE ACTION REQUESTS**: Seller shall submit copies of all Corrective Action Requests (CARs) issued to Seller by the Defense Contract Management Agency (DCMA) or Buyer's Government customer to Buyer within (2) days of receipt. All such CARs shall be submitted to GA-EMS Quality Assurance via email to EMS-SDR@ga.com and the GA-EMS Authorized Purchasing Representative specified in the Order.
- 9) **DELIVERABLE DOCUMENT/DATA ITEM SUBMITTAL**: Submission of all deliverable documentation/data item(s) shall be done in accordance with 49200P00002, which can be found on Buyer's Procurement website at <http://www.ga.com/quality-assurance>.

(201a) Quality Management System (Q9001) (Certification or Compliance Required)

Seller shall establish, document, implement, and maintain a Quality Assurance (QA) program that complies with the applicable requirements of ANSI/ISO/ASQ Q9001, Quality Management System – Requirements (without tailoring), as appropriate for the work to be performed under the Order. ISO 9001 certification is not required. A copy of Seller's Quality Management System (QMS) manual shall be provided to Buyer upon request.

(202a) Quality Inspection System

Seller shall establish and maintain a documented quality inspection system that is acceptable to Buyer. A copy of Seller's quality manual shall be provided to Buyer upon request.

(203) Superseded by 200(2)

(204) Superseded by 200(3)

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(205) Quality Management System per ASME Boiler and Pressure Vessel Code

Seller shall establish, document, implement, and maintain a quality control system that complies with all American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC) requirements, including material, design, fabrication, examination and inspection of vessels and vessel parts in accordance with a quality program approved by the ASME BPVC (applicable section requirements).

Seller shall submit its ASME certificate to Buyer within ten (10) business days of the issuance of the Order.

(207) Quality Assurance Plan

Seller shall develop a Quality Assurance Plan (QAP) specific to the Order requirements. The QAP shall perform the following tasks:

- Identify and invoke project applicable requirements of the Seller-documented Quality Assurance Manual (QAM), and other manuals, instructions, or documents used in implementing the QA program.
- Provide a method for documenting the unique QA requirements for the Order (Buyer requirements that may differ from the Seller-documented program) and for prescribing implementation of these activities. It is not necessary, or desirable, to repeat the requirements already stated in Seller's QAM.
- Identify the personnel and functions responsible for defining, approving, and implementing the QA program for the Order. This can be accomplished through the use of an organizational chart.

The QAP shall be reviewed and approved by Buyer prior to start of work under the Order.

(208) Software Quality Assurance Plan

Seller shall develop a Software Quality Assurance Plan (SQAP) specific to the software requirements of the Order.

Within 30 days of Order award, Seller shall provide a copy of the appropriate documentation that describes Seller's SQAP for software (e.g., software development plan, software configuration management plan).

Software documentation shall be sufficient to ensure the following:

- All requirements are achieved or deviation/waivers are submitted to Buyer.
- Configuration is correct and deliverables are properly identified and marked.
- Planned level of acceptance is achieved and/or approved deviation/waivers are made part of the deliverable documentation package to Buyer.
- Operating instructions accompanying the developed software are sufficient to enable loading, initialization, and operation by Seller's personnel.
- Witnessing/reviewing and Buyer approval of validation/verification software is complete.

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(209) Software Quality Management System

Seller shall maintain a Software Quality Management System (SQMS) that meets the intent of ISO 9001 and the guidelines of ISO/IEC/IEEE 90003.

Seller shall maintain a Software Engineering Institute (SEI) Capability Maturity Model Integration (CMMI) Level 2 using a benchmark appraisal.

Seller shall maintain a SEI CMMI Level 3 (using a benchmark appraisal) or achieve CMMI Level 3 during the performance of the Order.

Seller shall propose a software quality system that must be evaluated by Buyer as acceptable prior to commencement of any of Seller's software development activities.

(210) Control of Test Software

Seller shall maintain a system for the control of software used in the qualification/acceptance testing of deliverable hardware, software, and firmware to be furnished under the Order.

Seller shall maintain procedures and test records for items delivered to Buyer and those records shall be made available for Buyer review.

(210a) Control of Test Software

Seller shall maintain a system for the control of software used in the qualification/acceptance testing of deliverable hardware, software, and firmware to be furnished under the Order. Seller shall also provide the software test tool to Buyer upon request.

Seller shall maintain procedures and test records for items delivered to Buyer. Test records shall be made available for Buyer review.

3.2 Source Evaluation/Inspection

(212) Right of Access

Seller shall allow Buyer or its delegate, Buyer customer(s), and the US Government, which includes regulatory authorities, access to Seller's facilities and those of its sub-tier suppliers (including internet access) for the purpose of verifying compliance with the requirements of the Order. Verification may include, but is not limited to, such activities as witnessing operations in progress, reviewing QA documents and records, and performing audits. Upon request, Seller shall provide Buyer any and all quality information, documents, and records as required. Upon request, Seller shall provide a private, climate-controlled, furnished office space with telephone and internet access for Buyer and/or Government representatives for the period of performance of the Order.

(212a) Superseded by 212

(213) Critical and Major Characteristics

All attributes and characteristics identified on the design documents as Critical or Major will require 100% Seller inspection and may also require witness by Buyer. Actual inspection results of each characteristic shall be recorded and documented. All results shall be made available to Buyer upon request.

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(213a) Critical Safety Items - Process and Operation Sheets

Seller and its sub-tier suppliers shall submit process and operation sheets to Buyer for approval within thirty (30) calendar days after issuance of the Order. The process and operation sheets shall identify a detailed step-by-step account of the procedures necessary, in the proper sequence, to manufacture the Critical Safety Item (CSI).

The process and operation sheets must indicate operation number, description, tolerance (specification), location, and sub-tier suppliers, etc., necessary to control manufacturing operations.

After Buyer has granted approval of the process and operation sheets, Seller shall complete the process and operation sheets and have them stamped or signed off by an in-process operator and/or inspector. Process and operation sheets may also include the inspection method sheets noted in Quality Clause 213b, and must be provided to Buyer upon completion.

(213b) Critical Safety Items - Inspection Method Sheets

Seller and its sub-tier suppliers shall submit inspection method sheets for approval by Buyer within thirty (30) calendar days after issuance of the Order. The inspection method sheets shall identify the CSI characteristics (including minors) to be inspected, special instructions, item, drawing zone, acceptability limits, inspection tooling/method, and frequency. The completed inspection method sheets shall have the actual inspection results recorded with inspector’s stamp or signature and date. Inspection method sheets may be included as an integral part of the process and operation sheets noted in Quality Clause 213a, and must be provided to Buyer upon completion.

(213c) Critical Safety Items - Material Identification Code Mark

This Order is for the procurement of items with Critical Application Item (CAI)/CSI characteristics that require Material Identification Code (MIC) marking. Seller shall submit all CSI documentation associated with the identified CAI/CSI feature up to the Government Source Inspection (GSI) hold point associated with the MIC mark request to Buyer for review and acceptance prior to applying the MIC mark. This documentation set, referred to as the MIC mark package, may include but is not limited to the following:

- Completed and approved process and operation sheets per Quality Clause 213a and Quality Clause 213e, Step (a), as required by contract
- Completed and approved inspection method sheets per Quality Clause 213b and Quality Clause 213e, Step (b), as required by contract
- Quality conformance and lot sampling inspection results per Quality Clause 213d and Quality Clause 213e, Step (c), as required by contract
- Documentation of Government witness of GSI hold points
- Material certifications
- Supplemental documentation; e.g., Supplier Disposition Requests (SDR), Quality Notifications (QN)

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- Table of contents/summary page outlining documentation contained in package is required. Seller may use form EMS-0282 “Material Identification Code Mark Package Summary.” If Seller chooses not to use this form, all information listed on form EMS-0282 is required on Seller’s index page. Form EMS-0282 can be obtained from Buyer’s Procurement website at <http://www.ga.com/quality-assurance>.
- For CAI/CSI assemblies, the MIC mark package shall include CAI/CSI characteristic results for all GSI hold points identified on the Order line item at both top level assembly level and subcomponent/subassembly level.

NOTE: Buyer reserves the right to identify non-CSI characteristics as GSI hold points on the Order line item. These non-CSI characteristic results are also required to be in the MIC mark package).

Seller shall contact Buyer’s Authorized Purchasing Representative specified in the Order to determine if any additional documentation is needed per contract requirements.

The MIC mark(s) shall be located near, and in the method of, the part marking indicated on the applicable drawing (except when ink stamp and stencil are specified that for the purposes of traceability are not considered permanent. In these cases, the MIC mark shall be a metal stamp, laser etch, vibro-etch, or chemical etch unless the use of such marking methods will cause damage to the functionality of the part). Deviation from any of these methods shall require submission of an SDR, with Buyer approval. Application of the MIC marking will be verified by the designated Government representative.

NOTE: The MIC marking(s) applied to the individual parts must also be identified on all associated documentation. When submitting MIC mark packages for top level assemblies, objective quality evidence is not required to be submitted for existing MIC-marked subcomponents of that current assembly; however, the part number, revision, serial number, and MIC number issued for those subcomponents must be included in the table of contents.

(213d) Critical Safety Items - Inspection for CAIs Including CSIs

All CAIs and CSIs shall undergo Critical/Major characteristics inspection and, as noted on design documents, nondestructive inspections to verify that CAI or CSI items are within specifications. Actual inspection result for all Critical or Major characteristics will be recorded by serialized part number, and shall be included in each document package.

Seller shall perform quality conformance and lot sampling inspections for all associated features and characteristics that are present in the drawings and specifications. The inspection results (actual readings and/or measurements) will be recorded on all of Seller’s CSI/CAI inspection and certification documentation:

- Features/attributes/requirements classified as Critical and Major on the drawing(s) or within the technical specification will be inspected 100%.

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- Unless otherwise specified, attributes for plating, hardness, and non-destructive testing (NDT) shall be inspected 100%.
- Class 3 threads, dimensions, and geometric feature controls with a tolerance range of 0.010 in. or less, will be inspected and recorded using an acceptable quality limit (AQL) of 1.0 and the General Inspection Level II as defined by ANSI/ASQ Z1.4.
- Seller shall inspect and record all other Minor characteristics using an AQL of 4.0 and the General Inspection Level II as defined by ANSI/ASQ Z1.4.

(213e) Critical Safety Items/Critical Application Items

All attributes/characteristics identified on the design documents as a Critical and/or Major characteristic will require 100% inspection by Buyer, with actual inspection results of each characteristic recorded, documented, and provided to Buyer.

Section (a) below is only a requirement for drawings that are designated as CSI.

- a) **CSI – Process and Operation Sheets/Preapproval:** Seller and its sub-tier suppliers shall submit process and operation sheets to Buyer for approval within thirty (30) calendar days after issuance of the Order. Refer to DI-SAFT-81934 for the specific contents required in this report.

NOTE: Manufacturing of CSI hardware shall not commence until Buyer has provided formal authorization to proceed.

Section (b) below is only a requirement for drawings that are designated as CSI.

- b) **CSI – Inspection Method Sheets/Preapproval:** Seller and its sub-tier suppliers shall submit inspection method sheets to Buyer for approval within thirty (30) calendar days after issuance of the Order. The inspection method sheets shall identify objective quality evidence necessary to demonstrate the item conforms to all requirements and specifications, from raw material to finished product.
- Seller may use its own report format, provided on an 8 ½ by 11 inch (metric A4) page size, and delivered electronically.
 - The report must contain a title page containing item number, item description, revision, Order number, title of subcontract data requirements list (SDRL) if applicable, and the distribution list.
 - The individual sheets must indicate the following:
 - Item number, revision and item description
 - Serial number(s)
 - Lot size
 - Sample size (and associated acceptable quality limit [AQL])
 - Characteristic inspected
 - Classification of characteristic

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- Specification (tolerance)
- Inspection tooling/method
- GSI agent's name for each GSI hold point
- Sign or initial or stamp, and date of Quality Control inspector (for all inspection hold points)

NOTE: Manufacturing of CSI hardware shall not commence until Buyer has provided formal authorization to proceed.

Section (c) below is a requirement for drawings that are designated either as CSIs or CAIs.

c) **CSI/CAI:** Inspection of all CSIs and CAIs shall undergo inspections as required by design and contractual documents to verify items are within specifications. Seller and its sub-tier suppliers shall perform quality conformance and lot sampling inspection for all associated features and characteristics that are present in the drawings and specifications with results (actual readings and/or measurements) of each characteristic recorded, documented, and provided to Buyer. The lot sampling shall be performed as follows:

- Features/attributes/requirements classified as Critical and Major on the drawing(s) or within the technical specification shall be 100% inspected and results recorded..
- Unless otherwise specified, attributes for plating, hardness, and NDT shall be 100% inspected and results recorded.
- Class 3 threads, dimensions, and geometric feature controls with a tolerance range of 0.010-inch or less, shall be inspected and recorded using an AQL of 1.0 and the General Inspection Level II, as defined by ANSI/ASQ Z1.4.
- Seller shall inspect and record all other Minor characteristics using an AQL of 4.0 and the General Inspection Level II as defined by ANSI/ASQ Z1.4.

Section (d) below is only a requirement for drawings that are designated as CSIs.

d) **CSI – Process Operation and Inspection Method Sheet Data/Submittal:** Upon receiving formal authorization from Buyer to commence manufacturing of CSI hardware, Seller and its sub-tier suppliers shall:

- At the conclusion of each GSI event, submit Buyer and Government stamped or signed and dated process operation and inspection method sheets with objective quality evidence to Buyer.
- Seller shall submit the process operation and inspection method sheets, as separate documents (i.e., separate electronic files), with objective quality evidence within 72 hours of the GSI event, completed up to the level of the GSI event.
- Actual inspection result for all Critical or Major characteristics will be recorded by serialized part number, and shall be included in each document package.

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NOTE: For process operation and inspection method sheets that contain several GSI hold points, Buyer will require multiple submittals of partially completed process operation and inspection method sheets up to each GSI hold point.

(213f) Critical Safety Items - Disposition of Scrap Items

For purposes of this Quality Clause only, Critical Safety Items (CSIs) are defined as components or assemblies identified on the engineering drawing as CSI that have been completed.

For CSI items or completed assemblies that contain CSI subcomponents, as defined above, that Seller has determined should be scrapped, Seller shall obtain disposition from Buyer through the Supplier Disposition Request (SDR) process outlined in Quality Clause 221, Control of Nonconforming/Modified Items. Seller shall not dispose of scrap completed items with CSI classification.

(214) Source Inspection/Hold Points (5-day Notice)

Source Inspection: Buyer source inspection/acceptance is required on the Order. Seller shall notify Buyer a minimum of five (5) working days via e-mail to EMS-SourceInspection@ga.com prior to start of an acceptance test or inspection of a designated hold point to allow for scheduling of Buyer’s Quality Representative to be in attendance. Seller shall have technical data (e.g., drawing, specification, certification, etc.), available for use in support of the source inspection activity. Source in-process inspection points shall not be by-passed.

When in-process Buyer source inspection is required, Buyer’s Source Inspection Coordinator or Quality Representative shall coordinate with Seller. Seller shall provide reasonable facilities and assistance, including all quality records and related data for the safe and efficient performance of Buyer inspections.

Seller shall provide gauges, tools, fixtures, and jigs necessary to perform the inspections. Seller shall also provide sufficient rigging/material handling services and manpower to setup/configure/operate equipment and machines used to accomplish the inspection task. This Seller assist requirement shall be applicable to 100% of the Order quantities.

Seller shall ensure that evidence of Buyer source inspection is indicated on or attached to the shipping report accompanying each deliverable Order item.

Hold points will be designated by Buyer in the Order. Seller shall include Buyer designated hold points in the manufacturing instructions (e.g., router, traveler, task or sign-off sheets).

(214a) Source Inspection/Hold Points (7-day Notice)

Source Inspection: Buyer source inspection/acceptance is required on the Order. Seller shall notify Buyer a minimum of seven (7) working days via email to EMS-SourceInspection@ga.com prior to start of an acceptance test or inspection of a designated hold point to allow for scheduling of Buyer’s Quality Representative to be in attendance. Seller shall have technical data (e.g., drawing, specification, certification, etc.) available for use in support of the source inspection activity. Source in-process inspection points shall not be by-passed.

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When in-process Buyer source inspection is required, Buyer's Source Inspection Coordinator or Quality Representative will coordinate with Seller. Seller shall provide reasonable facilities and assistance, including all quality records and related data for the safe and efficient performance of Buyer inspections.

Seller shall provide gauges, tools, fixtures, and jigs necessary to perform the inspections. Seller shall also provide sufficient rigging/material handling services and manpower to setup/configure/operate equipment and machines used to accomplish the inspection task. This Seller assist requirement shall be applicable to 100% of the production quantities.

Hold Points: Hold points will be designated by Buyer on the Order. Seller will include the Buyer designated hold points in the manufacturing instructions (e.g., router, traveler, task or sign-off sheets).

(215) Government Source Inspection (5-day Notice)

Government Source Inspection (GSI) is required prior to shipment of product from Seller's facility. Upon receipt of the Order, Seller shall promptly notify the appropriate cognizant Government representative so appropriate planning for GSI can be accomplished.

When products are ready for inspection, Seller is responsible for notifying the applicable Buyer Quality Representative (via EMS-SourceInspection@ga.com) and the Government representative a minimum of five (5) business days prior to the scheduled inspection for non-resident, or two (2) working days if the Government representative is resident, to arrange for an inspection visit.

Seller shall provide gauges, tools, fixtures, and jigs necessary to perform the inspections. Seller shall also provide sufficient rigging/material handling services and manpower to setup/configure/operate equipment and machines used to accomplish the inspection task. This Seller assist requirement shall be applicable to 100% of the Order quantities.

Questions regarding the applicability of GSI should be directed to Buyer's Authorized Purchasing Representative specified in the Order.

(215a) Government Source Inspection (with DD Form 250)

At the time of each delivery of product under the Order, Seller shall notify Buyer for preparation of a Material Inspection and Receiving Report (DD Form 250) to be presented to the Government representative at the time of each delivery of product under the Order. A Quality Data Package (QDP) shall be submitted as part of the DD Form 250 Government acceptance process, as indicated on the Order.

The product shall not be released until Buyer has approved shipment.

NOTE: Any items shipped without proper authority may be returned to Seller at Seller's expense for inspection, or inspection may be conducted by the US Government at destination at Seller's expense.

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(215b) Government Source Inspection (7-day Notice)

GSI is required prior to shipment of any product from Seller's facility. Upon receipt of the Order, Seller shall promptly notify the appropriate cognizant Government representative so appropriate planning for Government inspection can be accomplished.

When the products are ready for inspection, Seller is responsible for notifying the applicable Buyer Quality Representative (at EMS-SourceInspection@ga.com) and the Government representatives a minimum of seven (7) business days for non-resident, or two (2) working days if Government representative is resident, prior to the inspection to make arrangements in support of the inspection.

Seller shall provide gauges, tools, fixtures, and jigs necessary to perform the inspections. Seller shall also provide sufficient rigging/material handling services and manpower to setup/configure/operate equipment and machines used to accomplish the inspection task. This Seller assist requirement shall be applicable to 100% of the production quantities.

Questions regarding the applicability of GSI should be directed to Buyer's Authorized Purchasing Representative.

(215c) Government Notification Points (7-day Notice, Non-CSI/CAI)

When the products are ready for inspection, Seller is responsible for notifying the applicable Buyer Quality, Purchasing, and Government representatives a minimum of seven (7) business days for non-resident, or two (2) working days if Government representative is resident, so that arrangements can be made by the Government representative to witness the inspections, if they so choose. This is not a mandatory hold point. Therefore, GSI is not required prior to shipment of product from Seller's facility.

Seller's only responsibility is to inform the above parties of the upcoming inspection. If Buyer and Government representatives choose not to be present at the time of the inspection, Seller may complete the operations and ship the product to Buyer.

(216a) Release to Manufacture

Seller shall not commence the manufacturing of hardware until Buyer has provided formal authorization to proceed. A Release to Manufacturing form (EMS-0312) shall be provided by Buyer to Seller upon confirmation that all pre-production deliverables have been submitted and approved by Buyer.

(217) Work Release Prior to Shipment

Deliverable items Order are subject to final inspection and approval by Buyer prior to shipment. Seller shall not ship any deliverable item prior to receipt of a Buyer Quality Assurance Work Release (form GA 580). A copy of the Quality Assurance Work Release (form GA 580) shall accompany each shipment. Execution of a Quality Assurance Work Release does not relieve Seller of its obligation to provide items that conform to all requirements of the Order.

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(217a) Work Release Prior to Shipment (GSI)

Deliverable Order items Order require Government Source Inspection (GSI) and a Government-approved DD Form 250 prior to shipment.

Preparation and submittal of the DD Form 250 to the Government shall be performed by Buyer, with full support from Seller.

Upon Government acceptance of the DD Form 250, and as evidence of the release of the items and all related documentation, a Buyer Quality Assurance Work Release form (GA 580) shall be completed, signed, and dated by Buyer’s Quality Representative and issued to Seller. A copy of the Buyer Quality Assurance Work Release form (GA 580) shall accompany each shipment in accordance with Quality Clause 215a. Execution of a Work Release does not relieve Seller of its obligation to provide items that conform to all requirements of the Order.

(218) First Article Inspection – First Lot Produced

First Article Inspection (FAI) requirements apply to a representative sample of the first lot produced of a part or an assembly. A new FAI report is not required with subsequent orders of the exact item, provided the Government contract number listed on the Order has not changed. However, if the Government contract number changes on subsequent Orders of the exact same item, then a new FAI report is required.

An FAI shall be performed by Seller in accordance with the requirements of SAE AS9102, Aerospace First Article Inspection Requirement, latest revision (or equivalent), and submitted to Buyer prior to shipment.

When documenting the FAI, Seller may use the forms contained within the latest version of SAE AS9102 or their equivalent, so long as the forms contain all the information required by SAE AS9102.

NOTE: Forms that are shaded may not be fully legible when scanned and therefore not acceptable.

(218a) First Article Inspection

A FAI report shall be submitted by Seller in accordance with the requirements of SAE AS9102, Aerospace First Article Inspection Requirement, latest revision (or equivalent), prior to shipment of product to Buyer. When documenting the FAI, Seller may use the forms contained within the latest version of SAE AS9102 or their equivalent, so long as the forms contain all the information required by SAE AS9102.

NOTE: Forms that are shaded may not be fully legible when scanned and therefore not acceptable.

FAI requirements apply to a representative sample of the first lot produced of a part or an assembly.

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When reusing part or all of a previous first article, as allowed by SAE AS9102, Seller must provide the following:

- Inspection/test results for all new or modified features of the current product
- Copy of the previous full FAI report

(218b) First Article Inspection with Functional Testing (NAVSUP)

A FAI report shall be submitted by Seller in accordance with the requirements of SAE AS9102, Aerospace First Article Inspection Requirement, latest revision (or equivalent). Buyer and NAVSUP witness of functional testing of first article sample is required prior to shipment of product to Buyer. A source inspection hold point and NAVSUP point of contact will be designated on the Order. When documenting the FAI, Seller may use the forms contained within the latest version of SAE AS9102 or their equivalent, so long as the forms contain all the information required by SAE AS9102.

NOTE: Forms that are shaded may not be fully legible when scanned and therefore not acceptable.

FAI requirements apply to a representative sample of the first lot produced of a part or an assembly.

When reusing part or all of a previous first article, as allowed by SAE AS9102, Seller must provide the following:

- Inspection/test results for all new or modified features of the current product
- Copy of the previous full FAI report
- SAE AS9102 Form 1 or a cover sheet that references the baseline part number/revision letter, previous and current Order number, reason for the partial FAI (if applicable) and a summary of all features of the current product that were re-inspected/re-tested.
- SAE AS9102 Form 1 or a cover sheet that references the baseline part number/revision letter, previous and current Order number, reason for the partial FAI (if applicable) and a summary of all features of the current product that were re-inspected/re-tested.

(219) NAVAIR Source Inspection (5-day Notice)

Items covered by the Order are subject to NAVAIR source inspection. Seller shall notify the cognizant NAVAIR contact specified in 49200R00003, which can be found on Buyer's Procurement website at <http://www.ga.com/quality-assurance>, and Defense Contract Management Agency (DCMA) as applicable, when the inspection hold points required by the Order are scheduled to take place. These inspection hold points are to be identified in Seller's process and operation sheets (Quality Clause 213a) and inspection method sheets (Quality Clause 213b), or Quality Clause 213e where specified. A minimum of five (5) working days notification is required to arrange the source inspection for the scheduled inspection. If contact cannot be made, Seller shall contact Buyer's Authorized Purchasing Representative specified in the Order.

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(219a) NAVAIR Source Inspection (7-day Notice)

Items covered by the Order are subject to NAVAIR source inspection. Seller shall notify the cognizant NAVAIR contact specified in 49200R00003, which can be found on Buyer's Procurement website at <http://www.ga.com/quality-assurance>, and DCMA as applicable, when the inspection hold points required by the Order are scheduled to take place. These inspection hold points are to be identified in Seller's process and operation sheets (Quality Clause 213a) and inspection method sheets (Quality Clause 213b), or Quality Clause 213e where specified. A minimum of seven (7) working days notification is required to arrange the source inspection for the scheduled inspection. If contact cannot be made, Seller shall contact Buyer's Authorized Purchasing Representative specified in the Order.

3.3 Control of Product Configuration

(221) Control of Nonconforming/Modified Items

All deliverable Order items shall conform to the requirements of the Order. Nonconformances that cannot be reworked to print, design modification requests, and requests for information to clarify drawing or specification requirements, shall be documented and submitted for consideration using the current version of the Supplier Disposition Request (SDR) form (EMS-0196).

Nonconforming items shall not be delivered or performed without prior written approval by Buyer, unless otherwise specified in the Order. The most current version of the SDR form may be obtained at <http://www.ga.com/quality-assurance>.

Product dispositioned as scrap shall be conspicuously and permanently marked, or positively controlled, until physically rendered unusable.

Completed SDRs and CARs shall be submitted to Buyer Quality Assurance via email to EMS-SDR@ga.com and Buyer's Authorized Purchasing Representative specified in the Order.

NOTE: The original SDR form submitted by Seller will not be returned to the Seller after Buyer disposition. Upon Buyer disposition of submitted SDRs, Seller will receive a system-generated Quality Notification (QN) form. Multiple QNs may be generated for one SDR.

3.4 Control of Monitoring, Measuring, and Test Equipment

(230) Certificate of Calibration

With each item, Seller shall include a Certificate of Calibration that is in compliance with ISO 10012 and traceable to the National Institute of Standards and Technology (NIST). The Certificate of Calibration shall include the following:

- Instrument type
- Seller part number
- Serial number
- Date of calibration
- Date next calibration is due

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(231) Calibration of Items

Seller’s system for control and calibration of measuring devices used for inspection, test, and product acceptance shall conform to ANSI/NCSL Z540.3, ISO 10012-1, or ISO/IEC 17025. Standards used for calibration shall have accuracies of at least four times the accuracy of equipment being calibrated, unless limited by the state of the art, and shall be traceable to the NIST.

(232) Reporting Out-of-Calibration Items

Seller shall notify Buyer within one (1) business day of discovery if a measuring device’s calibration is out of tolerance upon receipt.

3.5 Packaging, Storage, and Handling

(242) Packaging and Shipping Requirements

Seller is responsible for packaging and preparation for shipping. A procedure shall be prepared for Buyer review and approval thirty (30) days prior to Order delivery due date. The procedure shall include the following, as appropriate:

- Cleanliness inspections prior to packaging
- Use of preservatives and coatings
- Descriptions of specially designed shipping containers
- Lifting, handling, and rigging procedures
- Sketches
- Final inspection
- Method of shipping

3.6 Documentation

(247) Repairables – Test & Evaluation

This Order requires the product shipped to Seller be fully inspected and tested upon receipt for compliance to original engineering drawing and quality requirements for the specific revision received. Seller must then provide Buyer with a detailed report of the product’s as-received condition. Once Buyer evaluates the report, the Order will be amended to specify the rework/repair to be conducted, applicable Quality Clauses and source inspection requirements (if applicable). Objective quality evidence will be required and must be submitted as described in the “Documentation Submittal Instructions” in this document. Fulfillment of this order requires the product meet all its originally-specified inspection, performance and aesthetic requirements.

(248) Specialty Metals

This procurement is subject to the provisions of Specialty Metals Restrictions as specified in Buyer’s Terms & Conditions, DFARS 252.225-7009. Any Specialty Metals delivered under the Order shall be melted or produced in the US or a Qualified Country.

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(249) Country of Origin – Defense Contracts

This procurement is subject to the provisions of the Buy American Act as specified in Buyer's Terms & Conditions, DFARS 252.225-7001 and -7002. The Country of Origin of each Order Line Item in the shipment must be identified and readily apparent upon receipt by Buyer. For example, by a statement provided in the CofC, Packing Slip or other packaging materials.

(249a) Country of Origin – Gulftronic Contracts

Pressure containing components, and structural members and metals used in this order shall not be milled, manufactured or fabricated in, and raw material shall not be obtained from, China, India or Eastern Europe (as defined by the United Nations [UN]).

- The UN defines Eastern Europe as comprising Belarus, Bulgaria, Czech Republic, Hungary, Poland, Republic of Moldova, Romania, Russian Federation, Slovakia and Ukraine.
- Examples of regulated components affected by this Quality Clause include, but are not limited to, pressure vessels, process piping, valve bodies, metal sealing gaskets, flanges, frames, I-beams and fastener hardware.
- Examples of components which are exempt from this Quality Clause include, but are not limited to: electronics and soft goods such as gaskets, o-rings, seals, and valve packing.

The Country of Origin of each Order Line Item in the shipment must be identified and readily apparent upon receipt by Buyer (i.e., by a statement provided in the CofC, Packing Slip or other packaging materials).

(250) Stress Relief Procedures

Seller shall submit procedures for qualifying the stress relief of High-Yield (HY) and High-Strength Low-Alloy (HSLA) steel in accordance with PPD 802-7094539 for drawings that specify stress relief of HY strength or HSLA steel. Seller shall submit the data deliverable to Buyer for review and approval within thirty (30) calendar days after issuance of the Order.

(251) Environmental Stress Screening Procedures

Seller shall deliver Environmental Stress Screening (ESS) test procedures to Buyer for review and approval within thirty (30) calendar days after Order issuance, for the components identified. ESS test procedures shall be developed in accordance with SAE JA 1000-1. The ESS test procedures shall include vibration and thermal testing. Seller shall perform ESS on components identified in accordance with the approved ESS test procedures, and include the following:

- Brief description of the unit under test (UUT)
- List of functions to be tested
- Performance test procedure, describing methods used to test each function
- The nature of anticipated defects
- For thermal cycling: Tmin, Tmax, thermal chamber ramp rate, dwell time at temperature range limit, number of cycles and total cycle time

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- For vibration: number of axes, duration, spectral density, frequency limits, serial versus concurrent stimulation
- Detailed data for any resulting defects

Other requirements:

- Screening is required for 100% of the UUTs.
- Both thermal cycling and vibration must be employed.
- Items subjected to stress screening shall be tested thoroughly before and after the stress screen to ensure that no detectable failures at start or finish.

Recommendations (not required):

- The ideal practice is to conduct thermal cycling and vibration simultaneously.
- The UUT should be monitored with continuous functional testing. (If functional monitoring is not continuous, then functional testing shall be performed at temperature/vibration extremes.)
- The objective is 100% test coverage of all functions during screening.
- Automated test equipment is the preferred method of continuous functional testing.

(255) Certificate of Conformance

Seller shall submit a CofC with delivery of furnished items to the level specified in the Order with the following information at a minimum:

- Seller's name and address
- Order number
- Order Line Item number
- Identifying nomenclature as identified by the Order [i.e., item name(s), part number(s), revision, serial number(s) (if applicable), drawing and ECN (if applicable), etc.]
- Manufacturer's name and address (if different than Seller)
- Quantity shipped

Conformance statement: "All items furnished are of the quality specified and conform in all respects with the Order requirements, including specifications, drawings, preservation, packaging, packing, marking requirements, and physical item identification (part number), and are in the quantity shown on this or on the attached acceptance document" (or equivalent wording)

- Reference to any applicable SDR related to furnished items
- If items are Buyer furnished, so indicate
- Printed name, date, signature or stamp, and title of Seller's authorized representative signing the CofC.

Requirements of this Quality Clause also apply to Seller's sub-tier supplier certifications for "special processes" when Quality Clause 277 is specified in the Order.

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(256) Test Reports

Seller shall submit one (1) legible and reproducible copy of the actual test results of the lot or item acceptance tests required by the applicable specification, identifiable with test parameters and product submitted. The test report shall include the principal specifications, including revision numbers or letters that govern the production of the item. Where quantitative limits are established by the specification, the test report shall indicate the actual values obtained during testing. Test reports shall include the control identity (e.g., lot, heat lot, batch, serial number) of the material or item tested. If Seller is not the manufacturer, then Seller shall furnish the manufacturer's test report as described above.

These test reports must contain the test/inspection stamp of the individual performing the task, or the printed/typed name, signature, title of the authorized representative of the third party performing the test and date.

Test results will be subject to review and approval by Buyer.

(256a) Test Reports

Within twenty (20) days after completion of test, Seller shall submit one (1) legible and reproducible copy of the actual test results of the lot or item acceptance tests required by the applicable specification, identifiable with test parameters and product submitted. The test report shall include the principal specifications, including revision numbers or letters that govern the production of the item.

Where quantitative limits are established by the specification, the test report shall indicate the actual values obtained during testing. Test reports shall include the control identity (e.g., lot, heat lot, batch, serial number) of the material or item tested. If Seller is not the manufacturer, then Seller shall furnish the manufacturer's test report as described above.

These test reports must contain the test/inspection stamp of the individual performing the task, or the printed/typed name, signature, title of the authorized representative of the third party performing the test and date.

Test results will be subject to review and approval by Buyer.

(257) Test Plan/Procedure

Seller shall develop a detailed test plan/procedure that encompasses the final acceptance and verification requirements of the specifications or drawing of the Order. The test plan/procedure, and subsequent changes, shall be submitted to Buyer for coordination of the review and approval within thirty (30) calendar days after issuance of the Order.

One copy of Seller's test plan/procedure shall be designated for each unit tested and marked "Test Copy." Seller shall maintain the test copy of the procedure/plan with the original test log and data, and provide a copy to Buyer.

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(258) Pressure/Leak Test Results

Seller shall include copies of reports of actual pressure or leak test results (for each unit), part number, serial number, and test specification/procedure numbers, as applicable. These reports must contain the typed or printed name, signature and date of the authorized representative performing the test and must affirm conformance to specified requirements. The specifications must be listed, including the specification revision letter or revision number.

Test results are subject to review and approval by Buyer prior to shipment to GA.

(258a) ASME Pressure/Leak Test Results

Seller shall provide a copy of ASME Code Reports showing conformance of the units to the requirements of the Pressure Vessel Code. When required, the hardware markings must be in accordance with the applicable drawing/specification. The pressures tested/certified to and the method used shall be indicated.

Test results are subject to review and approval by Buyer prior to Seller’s shipment to Buyer.

(259) Material Certifications – Chemical and Mechanical Properties

Seller shall provide material test reports (MTRs) to Buyer along with a certification by the mill or testing facility that performed the tests certifying compliance to specific ASME or American Society for Testing and Materials (ASTM) standards. This requirement applies to all components in an assembly, as specified in the Order.

The MTRs shall provide both chemical and mechanical properties that include lot/heat/melt number and actual inspection and test values. Any subsequent heat treatment processes shall require test reports and certifications from the testing facility that shall include mechanical properties for the as-delivered condition. All MTRs shall include the typed name, signature, authority or title and shall be dated.

NOTE: If the material specification lists the testing of mechanical properties as “non-mandatory,” the MTR may be limited to chemical properties (unless otherwise specified in the drawing).

All documentation provided by Seller shall be legible, and at a resolution capable of being reproduced and scanned for electronic storage.

Complete material traceability shall be maintained throughout the manufacturing processes with appropriate records maintained. Traceability records shall be available for review by Buyer, when requested.

Seller shall not use alternate materials or grades of materials without Buyer’s prior written approval, even if such material has similar chemical and mechanical properties. If Seller desires to use alternate materials due to availability issues, Seller shall submit a request to Buyer using the SDR form (EMS-0196).

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For plastics and proprietary materials, a CofC from the material supplier attesting the material meets its specification is acceptable (i.e., a material test report citing chemical and mechanical properties is not required).

(259b) Certification of Titanium Material

Seller shall provide a laboratory certified test report from an accredited third party testing laboratory independent from the producing mill or other applicable material processors, stating the lot of material furnished has been tested, inspected and found to be in compliance with the applicable material specifications. The test report will list the specifications, including revision numbers or letters, to which the material has been tested and/or inspected and the material lot to which it applies. The test report shall include quantitative limits for chemical, mechanical, or mechanical properties, and contain the actual test and/or inspection values obtained. All test reports shall include the printed/typed name, signature, title of the authorized representative of the third party performing the tests and date.

(261) Inspection and Test Instructions

Seller shall prepare and maintain written instructions for inspections and tests performed in accordance with the Order. The instructions shall include identification of the item to be inspected or tested, measuring and test equipment to be used, details of inspection and test operations to be performed, and the criteria for determining conformance or nonconformance to Order requirements.

(262) Period of Useful Life

Seller shall furnish a certification stating the period of useful life for any assembly containing a limited shelf life material. The certification shall be identified to the Order and the assemblies to which it applies, and shall be signed and dated by Seller's responsible representative. Items having a limited shelf life must have a minimum of 75% shelf life remaining prior to shipment to Buyer.

(263) Limited Shelf Life/Rubber Parts

Seller shall identify each item of limited shelf life material with the cure or manufacture date, expiration date, and special storage and handling conditions, in addition to the normal identification requirements of name, part number, or code number, specification number, type, size, quantity, etc. This identification, including special handling conditions, shall be recorded on the CofC and shipping documents for the material. Prior to each shipment of the product, Seller shall furnish cure date, assembly date, part name and number, compound number, and manufacturer's identification (if different from part number) for rubber parts (synthetic or natural) installed in assemblies delivered under the Order. This information shall be identifiable with the assembly and, when applicable, with component parts within the assembly to which it applies.

(266) Control of Limited Shelf Life Materials

Materials with limited shelf life (e.g., epoxy, paint, adhesives, etc.), shall indicate the date of manufacture, expiration date, lot number and applicable specification on the container.

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All items delivered under the Order require submittal of date of manufacture when shelf life is based on date of manufacture (or date of shipment from the manufacturer when shelf life is based on date of shipment), based on specified method of shelf life determination.

The minimum shelf life remaining for each item shall meet the shelf life specified in the Order. If no minimum shelf life is specified, 75% of the item's shelf life shall be remaining for each item. Material Safety Data Sheets (MSDS) shall be provided with each shipment.

A CofC shall contain the following information in addition to the CofC information required by Quality Clause 255:

- Date of manufacture, if shelf life is based on date of manufacture
- Date of shipment from manufacturer, if shelf life is based on date of shipment
- Date of expiration

(268) Quality Assurance Data Package Requirements

Prior to each shipment, Seller shall prepare a QA Data Package for each unit and shall submit to Buyer for review and approval prior to shipping. Data packages shall be collated and contain a table of contents listing all documents within the package. Data package contents, as applicable to the Order, shall be as follows:

- Completed manufacturing plan, traveler, routing etc., detailing the manufacturing operation performed, the operator's acceptance including date and inspection point with associated inspection acceptance signatures and dates (for CSI only).
- In-process and final inspection records.
- Any documentation required by the Quality Clauses identified in the Order.
- Buyer approved SDRs, as applicable to the Order (see Quality Clause 221).
- Other documentation required as a condition of the order.
- Seller shall begin submitting documentation as soon as each subassembly or component is completed, per the "documentation submittal instructions" in this document.

(270) Superseded by 200(1)

3.7 Hardware

(272) ASME Boiler and Pressure Vessel Code Requirements

Welding performed on items to be delivered under the Order shall comply with the requirements of the ASME BPVC. Prior to each shipment, Seller shall provide with each item to be delivered, a copy of the data report conforming to applicable BPVC requirements for ASME Code Stamp holders.

Prior to each shipment, Seller shall provide two copies of ASME Code Reports showing conformance of the units to the requirements of the Pressure Vessel Code. When required, the hardware markings must be in accordance with the applicable drawing/specification. The pressures tested/certified to and the method used shall be indicated.

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Non-destructive examinations performed on items to be delivered under the Order shall comply with the applicable requirements of Section V of the ASME BPVC, and the requirements of Quality Clause 280. Acceptance criteria shall meet the requirements of the applicable ASME Code (e.g., Section I, IV, or VIII).

(273) Welding/Brazing Requirements for Commercial Products

Welding performed on items to be delivered under the Order shall comply with the requirements of AWS D1.1, D1.2, D1.3, D1.6, D9.1, ASME BPVC Section IX, or as specified on the drawing appropriate for the materials involved.

- 1) Welding Procedure Specification (WPS), Procedure Qualification Record (PQR), Brazing Procedure Specification (BPS), and Brazing Procedure Qualification Record (BPQR)

NOTE: This includes all WPSs or BPSs used in welding or brazing components specified on the Order. Any heat treating of the welded components is not allowed without specific allowance by the drawing, Order, post weld heat treatment (PWHT) specified on the Buyer approved WPS, or Supplier Disposition Request (SDR).

- a) Creation date, revision date, and revision level (letter or number)
- b) Report all pertinent data as required by the governing welding/brazing code or standard
- c) Conformance statement and signatures
 - i. All WPS, PQR, BPS, and BPQR certification statements and signature requirements shall be governed by the applicable welding code or standard
- d) If there are any special qualification conditions, Seller shall clearly describe these circumstances on the welding or brazing documents.
- e) All supporting documentation for the PQRs and BPQRs listed below shall be maintained, but not submitted, and are subject to review upon request.
 - i. Inspection reports (e.g., visual, radiographic, ultrasonic, magnetic particle, penetrant inspections)
 - ii. Original records/reports of test results in conformance with the applicable code or specification (i.e., actual laboratory report, not transcription of data)
 - Laboratory test result reports may include tensile tests, bend tests, hardness tests, chemical analysis, Non-destructive tests, or other tests required by the applicable Code or Standard.
 - iii. Material certification for the following:
 - Test plate/pipe base material
 - To include heat treat certification and furnace chart for any heat treating performed
 - Base material heat lot traceability
 - Filler material

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- 2) Weld Map Requirements:
- a) A weld/braze map identifying the WPS or BPS to be used to weld or braze each specific joint on the Buyer supplied drawing
 - i. The WPS or BPS identification shall be shown in a contrasting color text (e.g., red WPS identification text on a black line/text drawing) next to the weld/braze symbol on the drawing supplied by Buyer.
- 3) Welder Performance Qualification Record (WPQR), Welding Operator Performance Qualification Record (WOPQR) and Brazer/Brazing Operator (B/BO) Performance Qualification for all welders/welding operators and brazers/brazing operators performing welding or brazing on product specified in the Order:
- a) The following WPQR, WOPQR, and B/BO Performance Qualification documentation shall be maintained, but not submitted, in accordance with the contractual document archiving requirements and are subject to review upon request:
 - i. All supporting documentation for the WPQR, WOPQR, and B/BO Performance Qualification
 - ii. Inspection reports (e.g., visual, radiographic, ultrasonic, magnetic particle, penetrant inspections)
 - iii. Laboratory test result reports for tensile tests, bend tests, hardness tests, chemical analysis, etc. (actual laboratory reports, not transcription of data)
 - iv. Material certification for the following:
 - Test plate/pipe base material
 - To include heat treat certification and furnace chart for any heat treating performed
 - Base material heat lot traceability
 - Filler material
 - v. Conformance statement and signatures in accordance with the applicable welding code(s).
- 4) Document re-use requirements
- a) If Seller would like to re-use previously approved weld or braze documentation/data for new Buyer Orders of similar materials, Seller must notify Buyer Configuration and Data Management (CDM) via EMS-0364 with their intent to use previously approved weld documentation.
 - b) Seller shall only submit new or revised documentation for Buyer review.

NOTE: Seller shall ensure the Drawing/Contract welding requirements for the new Order are satisfied with the data re-use request.

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(275) Weld/Brazing Requirements for Procedures & Repairs

Table 3. Weld Documentation Submissions per Order

Item	Item Name	QC 275 Ref	Item Description	Notes
1	Procedure Qualification Record (PQR)	1(b)	Actual Recorded Parameter Data	Seller format, but must include all Essential Variables specified by the applicable Code
		1(d)(i)	Material Test Report (MTR)	Base and Filler materials
			Lab Test Results	All Code required test results must be recorded. Internal reports are acceptable if Seller has acceptable testing capabilities
2	Weld/Braze Procedures (as applicable)	1	WPS/BPS	Seller format, but must include all Essential Variables specified by the applicable Code
			Standard Welding Procedure Specification (SWPS)	Purchased from AWS; it is Seller's responsibility to ensure applicability
			Prequalified WPS	Seller format, but must include all Essential Variables specified by the applicable Code
			Weld Schedule	Seller format, but must include all Essential Variables specified by the applicable Code
3	Weld/Braze Map	2	Specifies which WPS(s) are used on the weldment(s)	A weld map is typically already developed for the weld inspection activities to meet Code requirements
4	Welder Summary Table	3(b)	List of the welders used by Seller to fulfill an order in lieu of individual WPQRs	Submit Form EMS-0365, which is available at http://www.ga.com/quality-assurance
5	As Applicable	1(g)(v), 4	Navy Approval Letters	Procedures that were "conditionally approved" by the Navy for other contracts will not be accepted by Buyer
		5	Document Reuse: Option 1	Submit Form EMS-0364, which is available at www.ga.com/quality-assurance
			Document Reuse: Option 2	
6	Repairs		Repairs	Reference Supplier Quality Guide

NOTE: Items shall be submitted separately.

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Table 4. One-Time Weld Documentation Submissions

Item	Item Name	QC 275 Ref	Item Description	Notes
1	Standard Operating Procedure (SOP)	3(a)	Written process describing how the welder qualifications are maintained	Must meet code requirements (e.g., 3, 6 or 12 months) for all codes used at Seller's facility
2	Objective Evidence of SOP Implementation	3(b)	Examples include, but are not limited to a Welder Maintenance/Continuity Log, purchased Weld Software, individual welder maintenance cards/reports, etc.	This evidence must be compliant with Seller's SOP
3	Sample WPQR	3(c)	Welder Performance Qualification Record (WPQR)	Seller format, but must include all Essential Variables specified by the applicable code to which the WPQR is certified.
NOTE: Items shall be submitted in one submittal. Seller is still required to maintain, but not submit, WPQRs in accordance with Code requirements and make them available for review by Buyer upon request.				

Welding/Brazing Procedures

- 1) Welding Procedure Specification (WPS), Procedure Qualification Record (PQR), Brazing Procedure Specification (BPS), and Brazing Procedure Qualification Record (BPQR)

NOTE: This includes all WPSs or BPSs used in welding or brazing components specified on the Order. Any heat treating of the welded components is not allowed without specific permission from the drawing, Order, or Supplier Disposition Request (SDR).

- a) Creation date, revision date, and revision level (letter or number).
- b) Report all pertinent data as required by the governing welding/brazing code or standard.
- c) Conformance statements and signatures.
 - i. All WPSs, PQRs, BPSs, and BPQRs shall be governed by the applicable welding code or standard certification statement and signature requirements.
- d) All PQRs or BPQRs supporting the WPSs or BPSs qualified after January 1, 2017 shall include the following:
 - i. All supporting documentation for the PQR and BPQR
 - Inspection reports (e.g., visual, radiographic, ultrasonic, magnetic particle, penetrant inspections)
 - Original records/reports of test results in conformance with the applicable code or specification (i.e. – actual laboratory report, not transcription of data)
 - Laboratory test result reports may include tensile tests, bend tests, hardness tests, chemical analysis, Non-destructive tests, or other tests required by the applicable Code or Standard.

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- Material certification for the following:
 - Test plate/pipe base material
 - (i) To include heat treat certification and furnace chart for any heat treating performed
 - (ii) Base material heat lot traceability
 - Filler material
 - e) Heat treat certification and furnace chart for any heat treating performed.
 - f) Multi-process PQRs are not permitted (i.e., each PQR must be for one welding process only)
 - i. Multiple PQRs may be referenced on a single WPS, allowing multiple welding processes in a single joint, in accordance with the applicable welding code.
 - g) NAVSEA S9074-AR-GIB-010/278, CSI, CAI, HY steel and HSLA steel Welding Procedures, if specified in the contract documents, require the following in addition to requirements “a” through “f” above:
 - i. Joint geometry sketch or reference to other governing joint geometry requirements (e.g., MIL-STD-22, AWS D1.1:2015, Figures 3.2-3.6).
 - ii. When required by the weld type, purge setup diagram and volume turnover rate.
 - iii. Supporting photographs as required to define unusual qualification setups and fixtures.
 - iv. For NAVSEA S9074-AR-GIB-010/278 welding, all WPSs, PQRs, BPSs, and BPQRs shall contain a certification statement, certifying to the requirements of NAVSEA S9074-AQ-GIB-010/248 and be signed by a responsible official identified in the contractors’ standard operating procedures.
 - v. Pertinent copies of Navy approval letters for WPSs, PQRs, BPSs, and BPQRs that have been previously approved for work related to NAVSEA S9074-AR-GIB-010/278.
 - vi. Submit approval letters received regardless of the contract they were issued under and how Seller intends to apply them during fulfillment of the requirements of the Order.
- 2) Weld/braze map identifying the WPS or BPS to be used to weld or braze each specific joint on the drawing supplied by Buyer.
- a) The WPS or BPS identification shall be shown in a contrasting color text (e.g., red WPS identification text on a black line/text drawing) next to the weld/braze symbol on the drawing supplied by Buyer

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- 3) Welder Performance Qualification Record (WPQR), Welding Operator Performance Qualification Record (WOPQR), and Brazer/Brazing Operator (B/BO) Performance Qualification for all welders/welding operators and brazers/brazing operators performing welding or brazing on product specified in the Order:
- a) A ONE time submittal of Seller's SOP governing the welder qualification and maintenance program.
 - b) An example of objective evidence showing implementation of the SOP (e.g., welder continuity log). Welder continuity shall be maintained in accordance with relevant codes and specifications.
 - i. NAVSEA S9074-AQ-GIB-010/248: Every three months
 - ii. AWS D1.X: Every six months
 - iii. AWS D9.1: Every twelve months
 - iv. ASME: Every six months
 - c) A single code acceptable WPQR and WOPQR that is a representative sample of the other WPQRs and WOPQRs used in production.
 - d) A summary table shall be submitted for every Order via EMS-0365.

NOTE: Individual WPQRs and WOPQRs are no longer required to be submitted for each Order. Only the items specified in Table 4, above, shall be submitted.

- 4) Copies of Navy approval letters for welder/welding operator (W/WO) and/or brazer/brazing operator (B/BO) workmanship training programs for work related to NAVSEA S9074-AR-GIB-010/278.
- a) If no Navy approval letter has been issued approving Seller's W/WO and/or B/BO operator workmanship training program please submit the following documentation.
 - i. A copy of Sellers' W/WO and/or B/BO workmanship training program/presentation.
 - ii. Evidence of satisfactory W/WO and/or B/BO workmanship training.
 - A copy of the training program/presentation attendance sheet.
 - A copy of the training exam for each welder with a minimum passing grade of 75%.
 - iii. A copy of the Level III examiner approval of the W/WO and/or B/BO workmanship training program.
 - iv. A summary table listing each W/WO and/or B/BO, the processes they are qualified to weld, when they were initially qualified and their most recent qualification maintenance or continuity date.

NOTE: Procedures that were conditionally approved by the Navy for other contract will not be accepted by Buyer.

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5) Document Reuse Requirements:

- a) If Seller would like to use previously approved welding and/or brazing procedures for new Buyer Orders specifying parts with similar raw materials/thicknesses and similar weld/braze specifications/codes, Seller must notify GA-EMS CDM by submitting EMS-0364 with their intent to reuse previously approved weld documentation and notify Buyer's Authorized Purchasing Representative specified in the Order concurrently.
- b) Seller is still required to submit new or revised documentation for Buyer's review. If any procedures or documentation is revised, then it needs to be submitted for review and approval prior to being used.
- c) Weld maps are required to exercise Document Reuse Option 2 and must be submitted with the request.

6) Repairs for Weld/Braze Nonconformance

If no provisions for the repair of weld defects are made in the applicable Code, the following requirements apply:

Weld repair procedures shall be written as detailed instructions and as a minimum shall include the following:

- a) Method of removal of weld or base metal
- b) Method used to ensure defect removal (e.g., Magnetic Particle Testing [MPT] or Liquid Penetrant Testing [LPT])
- c) Method for the re-welding/brazing, using qualified welders/brazers with an approved WPS (if different from the original)
- d) Extent, location and depth of the excavation, which shall be documented on an inspection report

The re-welded/brazed area shall be re-examined and documented by the methods used for the examination of the original weld.

(277) Special Process Certifications

Special processes include but are not limited to plating, coating, passivation, and heat treating.

Prior to each shipment of the product, Seller shall include a process certification to GA-EMS, verifying conformance to the drawing requirements, and stating the special process performed complied with an identified industry specification.

Heat treat certifications shall be accompanied by time/temperature charts and a summary description of the heat treat time and temperature data indicating the furnace and heat treat lot number. The certification shall state the name of the processor, date of processing, and the printed or typed name and signature of the responsible representative of the processor.

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At a minimum, the special process certification shall include the Order number, part description, serial number (if applicable), part/drawing number with revision letter and ECN (if applicable), name and location of the special processor, and the special process being performed (must match drawing note including the specification, class, type, and color, where applicable).

(278) Radiographic Inspection Submittals

Items requiring radiographic inspection shall be examined and processed in accordance with requirements specified in the Order. A method of identifying and cross-referencing the films, the items examined, and the film interpretation reports shall be provided.

Buyer's review and acceptance of radiographic inspection results is required prior to shipment. Additionally, Seller shall make available for review and in-process Radiographic Testing (RT) film and associated reports whenever requested by Buyer's non-destructive examination (NDE) Examiner. Buyer's representative may provide assistance and direction for coordinating this effort. If the review and acceptance is at Seller's facility, Seller will provide for reasonable facilities and assistance, including a suitable film review area.

Evidence of Buyer's acceptance must be indicated on the applicable radiographic report or certificate provided by the source performing the radiographic service.

(280) Non-Destructive Examination Requirements

Seller shall provide the documents associated with (a) and (b) below to Buyer for review and approval within thirty (30) business days prior to use:

- a) Procedures
 - i. A NDE procedure for each NDE method utilized, including a blank report form.
This is a one-time submittal unless the procedures are revised.

All NDEs, Leak Testing (LT), MPT, LPT, RT and Ultrasonic Testing (UT) shall be performed in accordance with detailed written procedures that meet the requirements of the applicable specifications called out on Buyer released drawings.

NOTE: Visual Testing/Inspection of Welds (VT) does not require a written procedure unless specified by the governing weld code/standard (e.g., NAVSEA S9074-AR-GIB-010/278).

- ii. A part-specific inspection method/technique sheet for LT, MPT, LPT, RT, and UT shall be submitted to Buyer for review and approval for each part to be inspected. Technique sheets are not required for VT. Revisions to technique sheets are not required unless a revision to the drawing or ECN changes the NDT requirements.

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b) Personnel qualifications

i. Seller's written practice

All NDE processes shall be performed and interpreted by personnel qualified / certified in accordance with a written practice developed by Seller to the requirements of SNT-TC-1A. The recommended practices of SNT-TC-1A are mandatory as modified by specifications. Seller's written practice must be approved by Seller's NDE Level III.

NOTE: *When personnel are certified in accordance with AWS QC1, as allowed below, the requirements for a written practice do not apply.*

ii. Personnel certification records

NOTE: An inspector with a current American Welding Society (AWS)/Certified Welding Inspector (CWI) certification is considered qualified to perform VT inspections of welds, unless the drawing or applicable weld specification (e.g., NAVSEA S9074-AR-GIB-010/278) mandates Level II VT certification to SNT-TC-1A.

SNT-TC-1A certification submittal requirements are as follows:

- The records shall be submitted separately (individual files) for each inspector.
- The records shall include each method the individual is certified for and the most recent eye exam date and results.
- The certifications shall include a certifying statement stating the individual is certified in the methods (e.g., MPT, LPT, UT, RT) and meets the requirements of the company's written practice (include document number).
- The records shall be signed by the certifying authority and title along with typed/printed name.

AWS/CWI certification submittal requirements are as follows:

- The records shall be submitted separately (individual files) for each inspector.
- Current copy of AWS/CWI certificate.

c) NDE Reports

Upon completion of the examination, Seller shall submit NDE reports that must include the following:

- i. Company name/identifier
- ii. The part/drawing numbers, revision (including ECNs, if applicable), and part description
- iii. Item serial numbers, lot number, heat number, etc., or other appropriate identification

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- iv. NDE procedure number and revision number or letter
- v. The approved part-specific inspection method/technique number
- vi. The method used
- vii. Equipment and materials used
- viii. Acceptance criteria
- ix. Date of examination
- x. The test results
- xi. Weld map and/or data sheet (if used)
- xii. The typed/printed name, signature and NDE certification level of persons performing and authenticating the test on each page
- xiii. The typed/printed name, signature and NDE certification level of persons interpreting the test results
- xiv. Indication of acceptance by Buyer and Government representatives.

NOTE: This is only applicable when Quality Clause 214 or 214a (Source Inspection Hold Points) and/or 215 and 215b (Government Source Inspection) are invoked in the Order.

- xv. All pages shall be paginated
- d) Visual inspection of welds/braze joints
All welds/braze joints shall be visually inspected per drawing/specification requirements and written procedures. Results shall be documented on a visual inspection report that meets the requirements of Subsection c) above.
- e) Low Halogen Penetrant Materials
When liquid penetrant materials with low halogen content are required, the test report shall include the material manufacturer's lot/batch number used and a certification of chemical analysis showing the actual halogen content for the applicable lot/batch.

(280b) Non-Destructive Examination Requirements

This item requires one or more methods of NDE - LT, LPT, MPT, RT, UT or VT.

Seller shall maintain written procedures for all NDEs. If specific standards or specifications are called out on the drawing or Order, then Seller's procedures shall reflect such requirements. All NDEs shall be performed by qualified inspectors, and records of inspector's certifications shall be maintained. The above procedures and records shall be made available to Buyer upon request.

With each shipment of product on which NDEs have been performed, Seller shall submit NDE reports that include procedure number and revision, summary of the technique, equipment and materials used, test results, name and signature of persons performing and authenticating the

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test, qualification level of persons interpreting the results (e.g., Level I, II or III), part numbers, serial numbers, lot number, heat number and other appropriate identification.

(284) Hydrostatic Testing Requirements

Hydrostatic testing shall be performed to detailed written procedures by qualified personnel. Procedures, technique sheets, and personnel qualification records shall be submitted to GA-EMS for review and approval within thirty (30) calendar days after issuance of the Order.

Pressure/Hydrostatic Test Report – prior to each shipment, Seller shall provide a certified report of pressure/hydrostatic test results. Unless otherwise specified, the report shall conform to the requirements as specified in the Order or test specification.

(286) As-Built Configuration List

An As-Built Configuration List (ABCL) shall be developed and provided to Buyer prior to each shipment of assemblies.

The ABCL shall be in electronic media format and shall contain the following information:

- Part number
- Part description
- Serial/Lot number (if applicable)
- Quantity
- As-built drawing revision letter
- Related ECN number
- Approved SDRs (record these and other pertinent data in the remarks column)

(287) Foreign Object Damage

Seller shall maintain a foreign object debris damage (FODD) prevention program in accordance with NAS-412 or other industry recognized standard as a guideline.

- 1) Seller's FODD prevention program shall include the review of design and manufacturing processes to identify and eliminate foreign object entrapment areas and paths through which foreign objects can migrate.
- 2) Seller shall ensure that applicable FODD requirements are flowed down to Seller's sub-tier suppliers, as necessary.
- 3) Prior to closing inaccessible or obscured areas and compartments during assembly, Seller shall inspect for foreign objects/materials and ensure no FODD barriers remain embedded (e.g., embedded protective plugs). Seller shall ensure tooling, jigs, fixtures, and test or handling equipment are maintained in a state of cleanliness and repair sufficient to prevent FODD. By delivering items to Buyer, Seller shall be deemed to have certified to Buyer that each item is free from any foreign materials that could result in FODD.

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- 4) All deliverable Order items shall be protected by Seller from contamination or damage from foreign objects during processing, testing, inspection, handling, and packaging prior to delivery to Buyer.

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

(288) Part Identification (Revision and Change Notice)

The identification method of marking a part shall be as described in the drawing notes. In addition to the marking requirements described in the drawing notes, all parts will be identified with the revision letter, and all applicable change notice numbers as referenced in the Order.

(289) Item Unique Identification (NAVSUP)

The Item Unique Identification (IUID) method of marking a part shall be as described in the drawing notes. In addition to the marking requirements described in the drawing notes, all parts will be identified with machine readable identification (MRI) marking. The applicable bar code data identifier descriptions will be identified on the Order and shall be in accordance with the following requirements:

Product Marking: DFARS 252.211-7003 – Item Unique Identification and Valuation per MIL-STD-130 “Identification Marking of U.S. Military Property”

3.8 Electronic Products

(293) Cable and Wire Harness Assembly Workmanship

Workmanship for items delivered under on the Order shall comply with the requirements of IPC/WHMA-A-620 Class 3, Requirements and Acceptance for Cable and Wire Harness Assemblies, unless otherwise specified on drawing, and shall meet the requirements specified on the assembly drawing.

A report shall be submitted for testing to each of the applicable requirements in the standard.

(293a) Fiber Optic Cable and Hybrid Wire Harness Assembly Workmanship

Workmanship for items delivered under on the Order shall comply with the requirements of IPC-D-640 Class 3 Requirements and Acceptance for Cable and Wire Harness Assemblies and/or MIL-STD-2042 Fiber Optic Topology Installation, unless otherwise specified on drawing, and shall meet the requirements specified on the assembly drawing.

A report shall be submitted for testing to each of the applicable requirements in the standard.

(294) Radiographic Submittal – Electronic Components

X-ray film of each item defined in the Order, an analysis of radiographic inspection performed, and an acceptance test report, including actual test values, shall be provided to Buyer at time of shipment. Individual article traceability to film shall be maintained.

Items delivered under the Order are subject to Buyer’s inspection at destination. These items will not be accepted by Buyer if Seller fails to ship X-rays with each item.

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(295) Printed Circuit Boards (Rigid Printed Boards)

Printed circuit boards (PCBs) delivered under the Order shall comply with IPC-6011 Class 3 and IPC-6012 Class 3, unless otherwise specified on the drawing. PCBs with more than two (2) layers shall be net list tested and documentation of net list shall be provided to Buyer prior to shipment of the product. Coupons and/or cross-section coupons shall be available and provided upon GA-EMS request.

(295a) Printed Circuit Boards (Flexible/Rigid-flexible Printed Boards)

Flexible/rigid-flexible printed circuit boards (PCBs) delivered under the Order shall comply with IPC-6011 Class 3 and IPC-6013 Class 3, unless otherwise specified on the drawing. PCBs with more than two (2) layers shall be net list tested and documentation of net list shall be provided to Buyer prior to shipment of the product. Coupons and/or cross-section coupons shall be available and provided to Buyer upon request.

(296) Electronic Assembly and Solder Workmanship – IPC-A-610

Workmanship for items delivered under on the Order shall comply with the requirements of IPC-A-610, Acceptability of Electronic Assemblies, and shall meet the requirements specified on the assembly drawing.

(296a) Electronic Assembly and Solder Workmanship – IPC-A-610 Class 3

Workmanship for items delivered under on the Order shall comply with the requirements of IPC-A-610 Class 3, Acceptability of Electronic Assemblies, unless otherwise specified on drawing, and shall meet the requirements specified on the assembly drawing.

(297) Superseded by 200(7)

(298) Solder Workmanship – IPC J-STD-001; Class 2

Workmanship of each items delivered under the Order shall comply with the requirements of IPC J-STD-001 Class 2, Requirements for Soldered Electrical and Electronic Assemblies.

(299) Solder Workmanship – IPC J-STD-001; Class 3

Workmanship of each items delivered under the Order shall comply with the requirements of IPC J-STD-001 Class 3, Requirements for Soldered Electrical and Electronic Assemblies.

(300) Qualified Products List

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

- 1) Seller shall submit a certification identifying the supplier/original equipment manufacturer (OEM) of the material described herein has been granted qualification by the Qualifying Activity in accordance with the applicable military specification.
- 2) The inclusion of products from the QPL shall not relieve Seller of its responsibility for providing items, that meet all specification requirements, or for performing the qualification, inspections, and tests specified for such items.
- 3) Mil-Spec parts shall not be altered.

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(301) Superseded by 200(6)

(302) Superseded by 200(6)

(303) Superseded by 200(6)

3.9 Radiation Monitoring Systems

(800) Flame Resistance Certificate of Conformance

Seller shall provide a CofC, signed by an authorized Quality Assurance representative, and certification to flame resistance to ANSI/NEMA WC 70/ICEA-S-95-658 and IEEE 383-1974.

(801) Aluminum Electrolytic Capacitor

Seller shall provide new parts that are not used or refurbished. The date code on all parts must not be older than four (4) years.

(802) ATEX Directive Requirements

Seller shall provide declaration of conformity stating conformance to the applicable ATEX requirements and EC type examination.

(803) Module with Aluminum Capacitors

All deliverable module(s) and assembly/ies containing aluminum electrolytic capacitors shall include new capacitors with date codes no older than four (4) years at the time of shipment to Buyer. Seller shall provide a certification that explicitly states all aluminum electrolytic capacitors contained within the module or assembly are new and less than four (4) years old. If the module or assembly does not contain any aluminum electrolytic capacitors, Seller shall provide a certification that explicitly states no aluminum electrolytic capacitors are contained within the module or assembly.

(804) Tape and Reel

Seller shall supply surface mount parts in the following preferred packaging, in declining order of preference:

- Tape and reel
- Cut/partial tape and reel with 18 in leader minimum
- Tray
- Tube
- Bulk or cut tape and reel

NOTE: Seller shall notify Buyer in writing utilizing the SDR process outlined in Quality Clause 221 prior to acceptance of order if final packaging is bulk.

(805) Weld - Radiation Monitoring Systems

- 1) Seller shall weld in accordance with welding specification 04707510 as applicable in accordance with the engineering drawing.
- 2) Welding specification 03607510 is superseded by 04707510.

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- 3) When undefined by the engineering drawing or Order, welding performed on items to be delivered under the Order shall comply with the requirements of one or more of the following specifications: AWS D1.1, D1.2, D1.3, D1.6, D9.1.
- 4) Seller shall provide a CofC in accordance with Quality Clause 255 with the following additional information:
 - AWS specification number
 - Welder name

NOTE: Seller shall maintain welder qualifications and provide them to Buyer for review upon request.

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APPENDIX A. ACRONYMS

Acronym	Definition
ABCL	As-Built Configuration List
ANSI	American National Standards Institute
AQL	Acceptable Quality Limit
ASME	American Society of Mechanical Engineers
ASQ	American Society for Quality
ASTM	American Society for Testing and Materials
ATEX	ATmosphères EXplosibles
AWS	American Welding Society
B/BO	Brazer/Brazing Operator
BPQR	Brazing Procedure Qualification Record
BPS	Brazing Procedure Specification
BPVC	Boiler and Pressure Vessel Code
CAI	Critical Application Item
CAR	Corrective Action Request
CDM	Configuration and Data Management
CMMI	Capability Maturity Model Integration
CofC	Certificate of Conformance
COTS	Commercial off-the-shelf
CSI	Critical Safety Item
CWI	Certified Welding Inspector
DCMA	Defense Contract Management Agency
DFARS	Defense Federal Acquisition Regulation Supplement
ECN	Engineering Change Notice
EEE	Electrical/Electronic/Electro-mechanical
EFTP	Electronic file transfer protocol
EIA	Electronic Industries Alliance
ESD	Electrostatic Discharge
ESDS	Electrostatic-Discharge-Sensitive
ESS	Environmental Stress Screening
FAI	First Article Inspection
FODD	Foreign Object Debris Damage
GA-EMS	General Atomics Electromagnetic Systems
GSI	Government Source Inspection
HSLA	High-Strength Low-Alloy
HY	High-Yield
ICEA	Insulated Cable Engineers Association

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Acronym	Definition
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IPC	IPC Association Connecting Electronics Industries
ISO	International Organization for Standardization
IUID	Item Unique Part Identification
JEDEC	Joint Electron Device Engineering Council
LPT	Liquid Penetrant Testing
LT	Leak Testing
MIBOM	Multilevel Indentured Bill of Materials
MIC	Material Identification Code (Mark)
MPT	Magnetic Particle Testing
MRI	Machine Readable Identification
MSDS	Material Safety Data Sheet
MTR	Material Test Report
NAS	Naval Air Station
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NCSL	National Conference of Standards Laboratories International
NDE	Non-Destructive Examination
NDT	Non-Destructive Testing
NEMA	National Electrical Manufacturers Association
NIST	National Institute of Standards and Technology
OEM	Original Equipment Manufacturer
PCB	Printed Circuit Board
PLM	Product Lifecycle Management
PQR	Procedure Qualification Record
PWHT	Post Weld Heat Treatment
QA	Quality Assurance
QAM	Quality Assurance Manual
QAP	Quality Assurance Plan
QCM	Quality Clause Matrix – Non CSI/CAI
QCM CSI	Quality Clause Matrix – CSI/CAI
QDP	Quality Data Package
QML	Qualified Manufacturers List
QMS	Quality Management System
QN	Quality Notification
QPL	Qualified Parts List
RT	Radiographic Testing

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Acronym	Definition
SAE	Society of Automotive Engineers International
SCAMPI	Standard CMMI Appraisal Method for Process Improvement
SDR	Supplier Disposition Request
SDRL	Subcontract Data Requirements List
SEI	Software Engineering Institute
SFTP	Secure File Transfer Protocol
SOP	Standard Operating Procedure
SOW	Statement of Work
SQAP	Software Quality Assurance Plan
SQMS	Software Quality Management System
SWPS	Standard Welding Procedure Specification
UN	United Nations
US	United States
UT	Ultrasonic Testing
UUT	Unit Under Test
VT	Visual Testing/Inspection of Welds
W/WO	Welder/Welding Operator
WHMA	Wiring Harness Manufacturer's Association
WOPQR	Welding Operator Performance Qualification Record
WPQR	Welder Performance Qualification Record
WPS	Welding Procedure Specification



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