The quality codes listed in this procedure are the only authorized and recognized codes to be used by SQE/QE’s when coding Purchase Orders and Requisitions.

1.0 PURPOSE

This document has been established to provide the quality flow-down requirements to applicable Suppliers listed on the Approved Supplier List (ASL). This document outlines requirements for suppliers of materials, products or services provided to Northrop Grumman Innovation Systems (NGIS). It is intended to clearly communicate to the Supplier the requirements they are responsible for meeting in relation to quality.

2.0 SCOPE

It is understood by both NGIS and the Supplier that this document is applicable to every purchase order/contract where the procured product, services or processes are deliverable/consumable by NGIS customers. Suppliers of specific component parts or special processes must meet the quality system requirements contained herein when performing to an NGIS purchase order/contract which contains reference to this document.

3.0 RESPONSIBILITY AND AUTHORITY

Mission Assurance/Quality SQE/QE — Responsible for ensuring proper quality codes are flowed down on the purchase order to the suppliers.

4.0 DEFINITIONS

None

5.0 FLOWCHART

None

6.0 PROCEDURE

6.1 Quality Code List

18QC01 Quality System Compliance and Flowdown – Mesa Use Only
18QC01P  Quality System Compliance and Flowdown – Plymouth Use Only
18QC02  Non-Conforming Material and Supplier Performance
18QC03  Certificate of Conformance
18QC04  Records Retention
18QC05  Packaging, Labeling and Traceability
18QC06  First Article Inspection (FAI) and New Product Introduction (NPI *note 3)
18QC07  Material and Process Certification
18QC08  National Aerospace and Defense Contractors Accreditation Program (NADCAP)
18QC09  Control Plan
18QC10  Certified Test Report
18QC11  Northrop Grumman Innovation Systems Property
18QC12  Welding Certifications
18QC13  Inspection Records
18QC14  Consent to Ship Approval
18QC15  Fixed Process and Approval of Changes
18QC16  Northrop Grumman Innovation Systems Source Surveillance
18QC17  Northrop Grumman Innovation Systems Source Inspection
18QC18  Government Source Surveillance
18QC19  Government Source Inspection
18QC20  Process Control and Verification
18QC21  Age Limitations, Life Limits and Shelf Life
18QC22  Large Material Packing Instructions
18QC23  Acceptance Inspection Equipment
18QC24  First Article Acceptance Test (FAAT)
18QC25  Requirements for Calibration Services
18QC26  Government Property
18QC27  Special Tooling Requirements
18QC28  Non-Destructive Test (NDT) Certification
18QC29  Certification Review Prior to Shipment
18QC30  Build Readiness Review
18QC31  Acceptance and Description Sheets
18QC32  Ammo Data Card
18QC33  Ammunition Lotting Requirements
18QC34  Homogeneous Material
18QC35  Electronics COTS
18QC36  ESD Packaging
18QC37  Packaging for International Shipment
18QC38  Explosive Packaging and Delivery
18QC39  Soldering
18QC40  Purchase Order Review
18QC41  Quality and Inspection System Requirements
18QC42  SPC Document Submittal
18QC43  Critical Characteristic Control Plan
18QC44  Classification of Characteristic Requirements

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6.2 Supplier Quality Assurance Requirements Text

18QC01 Quality System Compliance and Flowdown – Mesa Use Only

18QC01P Quality System Compliance and Flowdown – Plymouth Use Only

All suppliers shall maintain quality system certification to a current revision of ANSI/ASQ/ISO 9001:2000, or the current revision of SAE AS9100.

Registration with, or certification by, an independent third party certification body or registrar is required. Evidence of registration or certification shall be submitted upon completion of initial registration or recertification.

NGIS reserves the right to conduct surveillance at the supplier's facility to determine that the supplier's quality system meets the requirements of the quality standard.

NGIS recognition of the supplier's system does not constitute acceptance of goods or services or relief of purchase order or subcontract requirements.

The supplier shall have systems and methods to assure full compliance to all Quality Purchase Order (PO) codes and requirements applicable to this PO. When products or services applicable to this PO are procured by the supplier from sub-tier suppliers, the supplier shall have a system in place to flow the Quality PO code requirements and all other requirements, as necessary, to assure full compliance is achieved.

18QC02 Non-Conforming Material and Supplier Performance

Suppliers do not have MRB authority on behalf of NGIS.

The supplier shall not deliver any material that departs from drawing, specification or maintenance requirements. Non-conforming material is to be submitted for review and disposition on Supplier Request for Material Review Board (SRMRB). The SRMRB request form (QA-F007 or waiver form) is to be completed and routed to the applicable Supply Chain Buyer for review and disposition.

Root Cause and Corrective Action along with all objective evidence must be submitted with any SRMRB. Failure to submit will result in rejection of SRMRB request. If dispositioned acceptable, the non-conforming part(s) must be clearly identified and segregated from conforming product. A copy of the dispositioned and approved NGIS Nonconformance report shall accompany every delivery of the affected part(s). Product that does not meet NGIS requirements may be provided to NGIS only after this approval has been given.

Non-conformances discovered at NGIS (receiving inspection, in process build, final inspection, testing, or not previously approved on an SRMRB request), that are supplier caused, are subject to a processing fee –per rejection. Suppliers are responsible for all parts, processes, and services rendered by sub-tier suppliers.
Any quality concerns or rejections as a result of the sub-tier supplier are the responsibility of the supplier. NGIS may chargeback a supplier for rework, repair, analysis and/or travel related to nonconforming product where it has been determined that the non-conformance is supplier caused and the suppliers schedule to complete the rework/repair does not support NGIS’ scheduled need for the product.

The supplier shall notify NGIS Buyer of any systemic quality concerns that may affect the quality or performance of product already delivered to NGIS. The supplier shall provide prompt, written notification to NGIS Buyer if nonconforming product or process escapes are identified after shipment to NGIS.

Supplier performance is reviewed by NGIS SCM on a monthly interval. Suppliers whose performance is less than 95, may be subject to third party over inspection being imposed. Third party is defined as an independent contracted inspection service acting on the behalf of NGIS, performing final inspection(s) at the supplier location to ensure NGIS requirements are met. The cost of this third party over inspection would be at the supplier’s expense.

18QC03 Certificate of Conformance

The Supplier shall provide a Certificate of Conformance (CoC) with each shipment. Failure to submit the certification will result in rejection of the lot. Mark the appropriate container “DATA ENCLOSED,” when applicable.

The Certificate shall contain as a minimum:

- Supplier’s name and location.
- Manufacture’s name and location, if different.
- Date of Manufacture / expiration, if applicable.
- Date of Certification, signed or stamped and “Title” of certifying official of the supplier.
- NGIS Part Number, Revision level, and Description.
- Manufacturer’s Part Numbers and National Stock Number, if applicable.
- NGIS Purchase Order/Contract Number and line item number(s).
- Quantity of items.
- Identification of the lot number, batch and/or date codes, all serial numbers, if applicable.
- Shelf Life Requirements, if applicable.
- Fixed Process Identifier, if applicable.
- Reference any Non-Conformance/deviation number.
- All required governing specifications and revisions as specified on the NGIS Purchase Order/Contract and notes.
- A statement certifying material meets all requirements of the contract such as: “The undersigned, as the authorized representative of the contractor, warrants and represents all the information supplied above is true and accurate and that the material covered by this certificate conforms to all contract requirements, including but not limited to the drawings and specifications.”
**Note 1:** CoC shall be supported by inspection and test data, material analysis, or certification from the raw material producer or processor and shall be made available as requested for specifications such as raw material, processed material, processes, etc.

**Note 2:** When the items on this purchase order are supplied by a distributor, a copy of the manufacturer’s certification and the distributor’s certification stating compliance and the manufacturer’s name and address shall be provided. (e.g., raw material, pan stock, COTS (commercial off the shelf))

**Note 3:** Product inspected by sampling plan for delivery on this purchase order shall use an acceptance number zero; i.e.; accept on zero defects and reject the lot on one or more defects. Acceptance Quality Level (AQL) may be used to establish the proper sample size; however the acceptance number is zero.

**18QC04 Records Retention**

Records generated as the results of performance to a NGIS issued purchase order/contract shall be maintained and preserved as legible for a period of fifteen (15) years, unless otherwise directed by contract. It shall be available for review by authorized NGIS Mission Assurance/Quality representatives, NGIS customers, and/or Government representatives.

Additionally, distributors shall assure that manufacturers maintain quality assurance/inspection records and that these records are also available upon request. These records shall include, but are not limited to, receiving, in-process, and final inspection records, Certificates of Conformance, raw material mill certifications, test results, documented non-conformances and corrective actions, and measuring and test equipment calibration documentation etc.

Commercial Off the Shelf (COTS) may be subject to specific industrial standards; exemptions or modifications of record retention may apply.

**18QC05 Packaging, Labeling, and Traceability**

**Packaging** — The supplier is responsible for proper packaging to prevent damage, corrosion, or contamination to the parts whether through part-to-part contact or normal handling via the selected carrier environment. Packaging is part of the manufacturing process and shall be included in the supplier’s Quality Plan. Product produced that require tamper proof seals are to be placed across any areas of internal access. Parts shall be clearly identified and segregated by part number. Multiple part numbers and differing revisions shall not be mixed in the same container.

**Labeling and Traceability** — This does not replace any part identification as required by the engineering drawing and/or Purchase Order notes.

The supplier shall maintain a system to identify the manufacturer of the item(s) on this purchase order/contract to support material traceability. Supplier shall supply identifying lot number which shall be traceable back to manufacturing. The supplier shall maintain traceability data for parts, materials, and assemblies from procurement through fabrication, assembly, test, and delivery.
**18QC06 First Article Inspection (FAI) and New Product Introduction (NPI *note 3)**

The supplier shall perform and complete a First Article Inspection (FAI) in compliance with AS9102 requirements and submit the FAI to NGIS File Transfer web portal for approval prior to the delivery of any items on this purchase order/contract.

The FAI shall be performed for an item representative of the lot/process of the items on purchase order/contract. This includes all details and sub-assemblies which constitute the end-item ordered. The FAI shall not be considered complete until all non-conformities have been resolved and the FAI is reviewed and approved by NGIS Mission Assurance/Quality.

Allow 5 working days to complete the review of the FAI. Approval will constitute AS9102 Form 1 signed off by NGIS Mission Assurance/Quality Representative. No shipping prior to approval.

**Note 1:** The FAI shall be updated (Delta FAIR) when changes occur to any of the following: part number configuration, method of production, to include new process equipment, tooling, measuring equipment, and/or process flows, and/or facility re-location, change in location of machinery or applicable equipment (i.e. – unplug equipment and relocate to new area within the facility), a lapse in production for two years (or less if contractually required by customer), a natural disaster, such as fire, flood or earthquake which may adversely affect the manufacturing process, or when required as part of the corrective action process. Change of sub-tier suppliers requires a delta FAI submittal.

**Note 2:** A FAI is not required if one has already been submitted and approved for the product revision on a previous procurement and there have not been any changes listed in Note 1, unless otherwise specified.

**Note 3:** The supplier shall employ a New Product Introduction discipline with regards to this line item of the Purchase Order. The New Product Introduction is for all initial and first-time product production runs or product with a greater than two year gap in production, unless otherwise specified.

A checklist detailing the part manufacturing process plan shall be used to ensure acceptance and quality compliance. A review of the product process flow documentation and checklist for inspection and validation may be requested prior to production release and/or shipment. The package containing the initial shipment shall be identified along with the part used for First Article inspection.

**18QC07 Material and Process Certification**

The supplier shall submit certification(s) for the material(s), and/or process(es), either physically or electronically, in conjunction with any 18QC08 NADCAP requirements used in this order and include those in the shipping documentation package, when applicable.
Certification(s) shall include, as a minimum:

- The purchase order number/contract.
- Date of processing.
- Quantity processed, including accept/reject status.
- The material and/or process specification(s) number that the material(s) and/or process(es) conform to, where applicable.
- The nomenclature(s) of the material(s) and/or process(es) as defined on the drawing.
- The certifications shall be linked together by a common reference traceable forward and backward, e.g. heat lot.
- Certification(s) must be signed by an officer/agency that has certified the material(s) and/or process(es) used whose authority is binding on the company.
- Test results identified by reference to the applicable requirements (chemical, physical, and mechanical).

Failure to submit the certification(s) will result in rejection of the shipment.

**Note 1.** Where CARC paint is specified, at a minimum the following shall be submitted with every processed lot: (1.) a detailed information sheet identifying the CARC application procedures utilized. (2.) Certificate of Conformance for the CARC process and certifications for all sub-processes including but not limited to; Shot Peen, Abrasive- Grit Blast, Chemical Coating, Plating, Anodize, Etch, etc. (3.) Material certifications for paint and primers, including specific color, are required.

**Note 2.** All high strength fasteners shall be certified by the manufacturer to conform to the specified standards. An externally-threaded steel fastener of at least Grade 5, as defined by SAE J429, or Property Class 8.8 (metric equivalent), as defined by SAE J999 or ISO 898, e.g., bolts, screws, studs. Nuts are internally-threaded and not subject to the requirement.

**18QC08 National Aerospace and Defense Contractors Accreditation Program (NADCAP)**

All suppliers and their sub-tier suppliers shall use a NADCAP accredited process house for special processes. Suppliers shall provide evidence with shipment certifying the special process(es) were performed by facilities that are NADCAP approved for the process being performed (i.e. Non Destructive testing, Heat Treating/Furnace Brazing, Chemical Processing, Paint, Coatings, Welding). NADCAP supplier approval information can be found at: [https://www.eauditnet.com/eauditnet/ean/user/mainpage.htm](https://www.eauditnet.com/eauditnet/ean/user/mainpage.htm)

**18QC09 Control Plan**

The supplier shall create and submit a Control Plan prior to shipment. The Control Plan shall describe the overall process by which the supplier will assure the item’s conformance to all requirements of the purchase order/subcontract. The Control Plan will include the processes to be used to meet all purchase order/subcontract flow-down requirements, and the processes for assuring the quality of products from sub-tier suppliers. Any supplier documents referenced in the Control Plan shall accompany the submittal.
The Control Plan shall list the part characteristics which shall be inspected including the location of these inspections in manufacturing sequence, the sampling plans and quality levels, sampling procedures, the measuring and test equipment used, work instructions including revisions, criteria for approval or rejection of the product and the manner in which lot formations for product submissions are determined.

The Control Plan shall also include inspection and test records. The Control Plan shall be updated to describe any changes made to the present operation. Copies of revised Control Plan shall also be pre-approved.

18QC10 Certified Test Report

The supplier shall submit an entire test data report for this item upon successful completion of the item’s acceptance testing for each lot of material, parts, assemblies, and sub-systems by lot number prior to acceptance. The test report shall contain as a minimum:

- Company name and date.
- The NGIS purchase order/contract number.
- National stock number and drawing number.
- Date of Certification, signed or stamped and “Title” of Certifying official of the supplier.
- Description of supplies, lot number or other identification and lot quantity.
- Listing the characteristics inspected, product serial number (if applicable), sample and lot size, actual measurement(s), and number accepted.
- Recorded results obtained during all phases of the item’s testing through final acceptance testing (e.g.; material, processes, performance, functional, etc.) showing quantitative measurement results and tolerance(s) for values measured including all special testing performed on the item, any noteworthy observations, anomalies, or unexpected events; such as reports or raw material producers’ chemical, mechanical and physical analyses for product/process conformance.
- Serial numbers, lot numbers, date codes, and all other identifications used to track the item tested.
- Test data annotated with appropriate test operator and quality inspector level, signatures and/or stamps applied.
- Copies of all major and minor non-conformance’s and test failure reports with root cause and corrective action are required.
- A statement certifying material meets all requirements of the contract such as: “The undersigned, as the authorized representative of the contractor, warrants and represents all the information supplied above is true and accurate and that the material covered by this certificate conforms to all contract requirements, including but not limited to the drawings and specifications.”

18QC11 Northrop Grumman Property

Item(s) furnished to the supplier in conjunction with this order are the property of Northrop Grumman Innovation Systems (NGIS) or NGIS customer. The supplier assumes total responsibility for care and maintenance of said property unless otherwise agreed to in this
purchase order/contract. The supplier shall maintain accurate inventory and records for the property and provide this information to NGIS upon request.

The property is not to be used for products not identified on this procurement without the written consent of NGIS. Supplier shall not remove any markings or tags from the property. Supplier agrees not to sell, assign, loan, lease, mortgage, borrow against, pledge, or otherwise create a legal or equitable interest in the item(s) or otherwise permit the item(s) to be subject to any legal process.

18QC12  Welding Certifications

The supplier shall ensure that all weldments meet the design and fabrication requirement of the applicable Technical Design Package (TDP). The supplier shall list all applicable standards used to weld and inspect the weldment on the Certificate of Conformance. Suppliers shall retain an outline the processes and controls utilized to achieve those standards (i.e.; Non Destructive Testing, Lot testing, certification requirements for welders and inspectors, etc.).

Subcontractor welding processes and procedures may be audited for compliance. The buyer shall be notified prior to any necessary weld repair, except where prior buyer approval has been granted or waived. NGIS considers welding a NADCAP required special process.

18QC13  Inspection Records

Part inspection records shall be maintained by the supplier. Upon request, the supplier shall provide inspection reports for items on the purchase order. Reports shall include:

- The test and/or inspection procedure document number and revision level.
- Part number.
- Serial, lot, batch, or date code numbers, as applicable.
- Identification of each inspection point.
- The results of each inspection point.
- Records annotated with quality inspector signatures and/or stamps applied.

The supplier shall ensure the requirements are flowed down to support the item(s) on this order to maintain full traceability. Suppliers and sub-tier suppliers shall maintain their respective inspection records.

18QC14  Consent to Ship Approval

The supplier shall not ship any purchase order line item material until a Consent–To-Ship (CTS) approval is provided in writing from the NGIS Buyer. This CTS approval will be a signed CTS form (QA-F012) completed by NGIS or a waiver of the CTS requirement for the specified delivery. To obtain CTS approval the supplier is to contact the NGIS Buyer and schedule a CTS review with NGIS. The CTS review will require the supplier to provide all required Quality data three days in advance of the review. The CTS review may occur at the supplier’s site, at NGIS or by teleconference.
18QC15 Fixed Process and Approval of Changes

NGIS defines a fixed process as a process that has been reviewed and approved by NGIS and supplier representatives and is to be controlled from unapproved changes. The fixed process does not imply permanence, as submittals for changes are permissible. NGIS reserves the discretion to control any or all aspects of the fixed process.

Supplier’s configuration management system will control all elements of the supplier’s and sub-tier suppliers’ design, manufacturing and process procedures, test procedures, and of the items on this purchase order/contract. Suppliers are responsible to document and control any portion of this purchase order, which is to be performed by the supplier and extend applicable portions of the purchase order to any sub-tier suppliers.

Approvals — For parts identified by NGIS as fixed process, the supplier and sub-tier supplier shall be required to have approval by NGIS prior to initiation of production. Approvals do not relieve the supplier from exercising those control measures necessary to ensure that work performed by sub-tier suppliers is in accordance with specification for drawing requirements.

For each NGIS identified part requiring fixed process, the supplier or sub-tier supplier shall complete appropriate control document(s) and submit to NGIS for approval. The document(s) may be in the supplier’s or sub-tier supplier’s format and shall be the document used for actual performance and inspection.

The documentation describing the process should at a minimum include but is not limited to the following:

- Part number or process name to include revision.
- Process work instructions, technique sheets, inspection plans, process drawings, flowcharts, etc.
- Personnel performing special processes shall be certified in accordance with applicable special process certifications on file available for review.
- Packaging methods and materials.
- Signature and title of person on authorizing document(s).

Final approval shall have all required signatures on the stamp (see below) on the document for the fixed process submittal.

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Changes — The supplier shall notify NGIS of any proposed or inadvertent changes to the approved process. The supplier shall not proceed with the initiation of production without written approval from NGIS. The supplier shall ensure that these requirements are flowed down to sub-tier suppliers that support the item(s) on this order to the lowest subassembly level. See 18QC06, Note 1, for documentation of said changes.

Change documentation should at a minimum include but is not limited to the following:

- A complete description of the change, including a statement of the “From” and “To” conditions of change.
- Justification for the change, including background information in sufficient detail to allow an adequate study of the proposed change.
- The proposed affectivity of the change stated either in terms of a calendar date or a part serial number range.
- A copy of the revised document; proprietary information, if applicable, may be excluded.
- Recompletion of the approval stamp signature process.

Once the process has been approved, any change to the process requires NGIS written approval prior to implementation. Typographical errors, formatting errors, misspellings or clarifications changes are not considered a process modification or change.

18QC16 Northrop Grumman Source Surveillance

NGIS maintains the prerogative of source surveillance inspection by a NGIS Representative. NGIS shall notify the supplier if and when this option will be exercised.

18QC17 Northrop Grumman Source Inspection

Source Inspection by a NGIS Representative is required at the supplier’s facility. The supplier shall provide all test reports, inspection records (including access to all quality records and related data for contracted goods), facilities, assistance, equipment and personnel necessary to perform the appropriate inspection of product. Unless otherwise notified, the NGIS Representative will perform or witness end item acceptance tests.
Supplier shall notify the NGIS Buyer, unless otherwise notified, at least:

- Seven (7) working days prior to performing product acceptance testing and/or
- Fifteen (15) working days prior to the expected time of the presentation of the item to NGIS Representative for source inspection. Shipment shall be withheld pending necessary action by the NGIS Representative.

Upon notification from Supplier to NGIS buyer – of source readiness, NGIS SQE will make travel arrangements. In the event, supplier notifies NGIS of source readiness and then does not have product ready on agreed upon date, NGIS may initiate a debit memo for expenses incurred (i.e. change of flight fees, cancellation fees, et al.).

Acceptance of source shall be denoted by a stamp and/or signature or both by the authorized NGIS Representative on the supplier’s inspection document to be included in the shipping documents package.

Relief from this source inspection requirement may only be obtained with a written waiver of source inspection from NGIS Buyer signed by NGIS Representative. The request for source inspection waiver will include the build and inspection documentation for approval by the NGIS Mission Assurance/Quality Representative. The approved request shall be included with the shipping document package.

**Note:** If NGIS Customer source inspection is required, NGIS Customer Representative may accompany the NGIS Representatives when the source inspection is scheduled. During the scheduling of the source inspection NGIS Representative will notify supplier that NGIS Customer may be accompany him/her during the scheduled source inspection.

**18QC18  Government Source Surveillance**

During performance of this Subcontract/Purchase Order, activities of the supplier may be monitored by an authorized Government Representative through delegation from the Government QAR located at the contractor’s facility. This may include audits, inspections, and/or tests. Government Inspection or release of product prior to shipment is not required unless otherwise notified, in writing, by the authorized government representative. (Note: Neither notification of NGIS by the authorized government representative nor notification of the supplier by NGIS is required.)

**18QC19  Government Source Inspection**

Government inspection is required prior to shipment. Upon receipt of the order, promptly notify the Government Quality Assurance Representative (QAR) who is assigned to the supplier, so that appropriate planning for:

- Government Source Inspection (GSI) and/or
- In Plant Quality Evaluation (IQUE) can be accomplished.
In the event, the Government representative or office cannot be located, the supplier shall notify the nearest Army, Navy, Air Force or Defense Logistics Agency inspection office. If the representative or office cannot be located, the supplier shall notify NGIS Buyer immediately. The delegated government representative may review work instructions and identify mandatory inspection points that the government must accept prior to further processing of the item.

Supplier shall notify the NGIS Buyer, unless otherwise notified, at least:

- Seven (7) working days prior to performing product acceptance testing and/or
- Fifteen (15) working days prior to the expected time of the presentation of the item to NGIS Representative for source inspection. Shipment shall be withheld pending necessary action by the NGIS Representative.

A letter of delegation (LOD) authority signed by the DCMA (Defense Contract Management Agency) showing that the specific part number being shipped has been granted GSI delegation shall also be acceptable. Any letter of delegation authority must be linked to the part numbers that have been granted delegation. Evidence of Government Source Inspection (QAR acceptance stamp or office number and signature on the shipping document) shall accompany each shipment of product to NGIS.

18QC20 Process Control and Verification

NGIS requires the use of process controls on this purchase order. The supplier shall participate, to the level specified by NGIS, in the process for identifying key product and process characteristics. The process for identifying key characteristics may include:

- Quality Flow Down (QFD).
- Design Failure Mode Effects Analysis (DFMEA).
- Process Failure Mode Effects Analysis (PFMEA).
- Design of Experiments (DOE).

The supplier shall record data for all identified key product and process characteristics and submit the data with the deliverable product. The supplier shall use the data to optimize key processes.

The supplier shall develop process flowcharts showing the manufacturing and inspection steps, including process control points for key characteristics.

At any time, during the term of this purchase order/contract, NGIS may notify the supplier of specific requests for on-site product verification, and/or an audit function.

Process verification may include product selection of a random sample for independent inspection, re-inspection of samples, witnessing inspection, or test by an NGIS Representative. Process verification is to ensure product integrity is being maintained.

Audits may be performed on Materials, Product, Gaging or Test Equipment, Calibration, Special Processes, Procedures and Work Instructions covering the in-process activities at the supplier.
The supplier shall provide reasonable facilities, equipment, and assistance, including access to all quality records and related data for contracted goods.

18QC21  Age Limitations, Life Limits, and Shelf Life

Product supplied, or any product used in a part or assembly supplied under this purchase order/contract, is considered age sensitive by the product’s manufacturer. The shipping documents shall state the shelf life and any unique environmental storage conditions, if required. The supplier shall assure that a **minimum of 80% of the shelf life**, unless otherwise specified with a supplemental quality document, is remaining at time of shipment to NGIS. If the product requires unique environmental storage conditions, the exterior package shall be clearly marked indicating the type of storage required. The date of manufacture and expiration date must appear on a certificate supplied with the material. Mark the appropriate container with “Data Enclosed.”

18QC22  Large Material Packing Instructions

This special provision will take precedence over any conflicting packaging instructions contained herein. Package per applicable NGIS material handling instructions:

- OMH-0001 — Raw Material Special Packing Instructions.
  - All large billets, barrels, castings and forgings must be palletized and bound to the pallet with steel banding or equivalent method to constrain material. Parts shall not be mixed and shall conform to part dimensions with minimum overhang.
  - All small and medium size billets, barrels, castings and forgings must be contained using either wood or corrugated material depending upon material characteristics. Parts with critical surfaces must be individually packaged.
  - Each heat lot must be packaged separately.
  - Certifications for raw material shall be included with each heat lot.

18QC23  Acceptance Inspection Equipment

Acceptance Inspection Equipment (AIE) used to perform the inspections and tests of those characteristics specifically identified must be submitted to NGIS for approval prior to the first shipment of product. Acceptance of product by NGIS will not be granted prior to approval of AIE. AIE documentation shall contain sufficient information to allow review and approval.

AIE identification shall include the following:

- Part number, revision, and name.
- Specification number and paragraph, if applicable.
- Classification of characteristics number.
- Characteristic description and dimension/parameter.
- Purchase order number and revision.
Submission of standard measuring equipment shall include:

- Manufacturer.
- Model number.
- Accuracy.
- Calibration procedure, as applicable.

Functional gaging and laboratory equipment shall include:

- Gage number.
- Gage drawing (2 copies).
- Set-up, calibration and operating procedures, as required.

If the listed characteristic is performed by a sub-tier supplier or independent inspection service, their AIE must also be submitted by the Supplier to NGIS for approval. If functional testing is required, NGIS will specify the requirement in writing.

18QC24 First Article Acceptance Test (FAAT)

The supplier shall perform a First Article Acceptance Test (FAAT) in accordance with the FAAT Plan, AS9102 requirements, and any other requirements imposed by this purchase order/contract. The supplier shall submit the FAAT results to the NGIS Buyer for review and approval by NGIS Representative prior to production. NGIS reserves the right to witness and/or perform surveillance by NGIS personnel, Government and/or NGIS customer representatives in support of this purchase order/contract, which will be communicated via the FAAT plan or this purchase order/contract.

18QC25 Requirements for Calibration Services

Items supplied on this purchase order/contract require a calibration service and shall be calibrated by an organization whose system is in compliance with Calibration System Requirements; ISO 10012-1, Metrological confirmation system for measuring equipment; ISO/IEC 17025 using standards traceable to the National Institute of Standards and Technology (NIST), or ANSI/NCSL Z540-1, Calibration Laboratories and Measuring and Test Equipment—General Requirements.

The Supplier shall provide a calibration certificate for each unit or item delivered and has a data sheet attesting to the actual measurements for each NGIS identified characteristic of calibration.

18QC26 Government Property

Item(s) furnished to the supplier in conjunction with this order are the property of the U.S. Government. The supplier assumes total responsibility for care and maintenance of said property, in accordance with FAR 52.245-1, unless otherwise agreed to in this purchase order/contract. The supplier shall maintain accurate inventory and use records for the property and provide this information to NGIS upon request.
The property is not to be used for products not identified on this procurement without the written consent of NGIS. Supplier shall not remove any markings or tags from the property. Supplier agrees not to sell, assign, loan, lease, mortgage, borrow against, pledge, or otherwise create a legal or equitable interest in the item(s) or otherwise permit the item(s) to be subject to any legal process. The supplier shall use form DD1149 when transporting government property back to NGIS.

18QC27 Special Tooling Requirement

For all special tooling, that will be retained by the supplier for the purpose of fabricating production parts for NGIS, the supplier shall notify NGIS Buyer 15 working days prior to tool completion to schedule NGIS Tool Quality Source Inspection.

This order includes special tooling that will remain the property of NGIS or the U.S. Government. The referenced special tooling shall be stored at the supplier’s location. The supplier shall take reasonable care of said tooling. The special tooling is not to be used for products not identified on this procurement without the written consent of NGIS.

Supplier shall not remove any markings from the property. Supplier agrees not to sell, assign, loan, lease, mortgage, borrow against, pledge, or otherwise create a legal or equitable interest in the special tooling or otherwise permit the tooling to be subject to any legal process. Supplier shall attach a NGIS supplied property tag to the special tooling identified on this order. The supplier shall maintain inventory records for the identified item(s). Copies of such records shall be made available to NGIS upon request.

If the NGIS supplied special tooling included with this purchase order is used in the manufacture of any 387-xxxx or 230-xxxx part as either production or development/experimental, or is otherwise a Boeing contracted Special Tool, the supplier shall conform to the requirements defined by Boeing@ BDS Seller Special Tooling Requirements document # D950-11059-1. (Mesa only)

18QC28 Non-Destructive Test (NDT) Certification

Prior to fabrication on any deliverable item, the supplier shall provide the planned manufacturing, testing, and inspection procedures for NDT. These procedures shall include, as applicable, drawings of the special tooling that may be used for the dimensional acceptance and plans for performing tests on raw, semi-finished, and /or finished materials, including special process techniques to be approved by a NDT Level III. The procedures must document all operations to be performed. The supplier is responsible for meeting all drawing/specification and approved fabrication process requirements.

Supplier shall include with each shipment a certificate that lists the Non-destructive Tests (NDT) performed, the specification(s) used, NDT method used, and the results of the inspection. The supplier shall maintain records to include the procedures/techniques used signature or stamp of the employee performing the NDT, the NDT certification level of the employee, and the results.
Identification of any sub-contracted testing services performed shall be clearly noted with the name and location of the facility. When radiography is performed, the resulting radiographs will be supplied with the parts. Film must be identified with NGIS part number and serial number.

18QC29 Certification Review Prior to Shipment

Certifications and lot data shall be submitted to NGIS for review and approval prior to shipment. The supplier shall provide copies of certifications/documents to NGIS. Upon concurrence with the certifications, NGIS shall authorize shipment in writing. Advanced review and approval will not reduce the supplier’s responsibility for conformance to contractual requirements. The pre-submittal requirement is waived if NGIS Source Inspection is performed.

18QC30 Build Readiness Review

A Build Readiness Review (BRR) shall be used when new, complex, or unique processes or products are manufactured. NGIS needs to confirm materials and processes are accurate and conform to the Technical Design Package (TDP), process documentation, inspection requirements, test instrumentation/equipment, tooling, gages, and training, are completed prior to product build. Milestone tracking may be used to track progress and monitor schedule requirements.

18QC31 Acceptance and Description Sheets

The supplier shall submit Acceptance and Description Sheets (for propellants and explosives) for each lot or batch processed. Electronic submission shall be made by accessing the Worldwide Ammunition Data Card Repository Program (WARP) housing the Acceptance and Description Sheets modules. Unless otherwise directed, the Acceptance and Description Sheets requirement is a flow-down requirement that applies to suppliers, vendors, or subcontractors. NGIS will provide a list of items requiring Acceptance and Description Sheets. Interpretation of specific questions should be clarified by contacting the NGIS Buyer administering the purchase order.

18QC32 Ammo Data Card

The supplier shall submit an Ammunition Data Card in accordance with MIL-STD-1168, DI-MISC-80043 and the Worldwide Ammunition-data Repository Program (WARP) requirements with each shipment of material furnished under this purchase order. Unless otherwise directed, the ADC requirement is a flow-down requirement that applies to suppliers, vendors or subcontractors. NGIS will provide a list of items requiring ADCs. Interpretation of specific questions should be clarified by the customer/government representative or by contacting the NGIS buyer administering the purchase order.

18QC33 Ammunition Lotting Requirements

The supplier shall perform ammunition lotting in accordance with MIL-STD-1168. The ammunition lot number shall consist of a manufacturer’s identification symbol, a numeric code showing the year of production, an alpha code representing the month of production, a lot
interfix number followed by a hyphen, a lot sequence number when necessary, an alpha character used as ammunition lot suffix to denote a reworked lot. The ammunition lot number will not exceed 14 characters in length and no characters will be separated by spaces. The minimum number of characters used will be 13. If a one- or two-character manufacturer’s identification code is used, the remaining positions of the 3-character field will be filled by dashes (-), e.g., C--, CA-, etc. The following illustrates the construction of an ammunition lot number: AMC75D018-124B.

• AMC = Manufacturer's identification symbol.
• 75 = two digit numeric code identifying the year of production.
• D = A single alpha code signifying the month of production.
• 018 = Lot interfix number.
• 124 = Lot sequence number.
• B = Ammunition lot suffix (the alpha suffix).

18QC34 Homogeneous Material

All material supplied under this order shall be homogeneous as defined below. Homogeneous supplies are defined as material which is produced:

• To the same design as defined by NGIS and suppliers’ documentation.

• From the same material as defined by the applicable material specification. When alternate materials are allowed by the purchase order and associated documents, the supplier must certify to a specific alternate. After material has been submitted to NGIS, the supplier may not change alternates without prior written approval from NGIS. The supplier is not restricted to any source of supply of raw material as long as the material meets the applicable specification.

• By the same manufacturing process as defined by the supplier’s manufacturing plan. Changes in manufacturing location or production discontinuities of one month or more violate this requirement. All manufacturing process sheets shall have a revision date not later than the date of initial shipment of supplies to NGIS and the process used to manufacture the initial product shipment and all shipments thereafter.

Departure from these requirements must be approved in writing by MQE/QE prior to departure. Changes initiated by NGIS do not void this requirement.

18QC35 Electronics COTS

Certification and Traceability — The Supplier shall provide a Certificate of Conformance with each shipment. The certificate must be dated and signed or stamped by an authorized representative. Failure to submit the certification will result in rejection of the lot. Mark the appropriate container “Data Enclosed.” The Certificate shall include:
Required:

- Supplier’s name and location
- Manufacturer's part number
- Batch identification such as date code, lot code, serial numbers or other identification
- NGIS purchase order and line item number(s)
- Quantity of items.

As Applicable:

- Shelf life requirements such as shelf-life limitations, and storage conditions as recommended by manufacturer or required by specification
- NGIS part number, revision level, and description
- All required governing specifications and revisions as specified on the NGIS purchase order/contract and notes
- Any exclusions to the requirements of the applicable drawings, specifications, purchase document requirements, or design configuration requirements and the method by which such exclusions were authorized by NGIS (e.g., CAR, NC – deviation or waiver).

Counterfeit Parts Prevention — The supplier shall provide authentic parts with traceability certification to the Original Component Manufacturer (OCM). Counterfeit electronic parts and assemblies are defined in SAE AS5553: Counterfeit Electronic Parts, Avoidance, Detection, Mitigation, and Disposition. The supplier shall implement appropriate controls to assure product origin and conformance. This applies to any assemblies that contain electrical parts that could be procured from a sub-tier to the ultimate purchase order supplier.

Shelf Life — The items supplied under this order are subject to age limitations. The date of manufacture or the cure date and/or expiration date shall appear on each container and on a certificate supplied with the material. Unless otherwise notified the product shall remain useable for a minimum of 12 months after receipt at NGIS.

Moisture/Reflow Sensitivity — Surface mount devices shall be handled and packed in accordance with IPC/JEDEC J-STD-033, Handling, Packing, Shipping, and Use of Moisture/Reflow Sensitive Surface Mount Devices.

Electrostatic Discharge — If the part is considered to be sensitive to electrostatic discharge all containers and paperwork shall be marked accordingly, reference MIL-STD-129, Military Marking for Shipment and Storage, Figure 37. For ESD Class 1 and 2 components all leads must be shorted by material having a surface resistivity (rs) between 1E5 and 1E12 ohms per square. Packing should provide the necessary protection during shipping.

Additional information can be found in MIL-STD-1686, Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices), and MIL-PRF-81705E, Barrier Materials, Flexible, Electrostatic Discharge Protective, Heat-Sealable. NGIS has determined that “Pink Poly”
(polyethylene antistatic) bags or material is an unacceptable packaging medium and shall not be used.

Shipping Authorization — Written authorization from the buyer is required for any deviations from the purchase order requirements, including partial shipments or shipment of multiple date codes per line item.

Solderability — Solderability of electronic and mechanical components and wires must meet the criteria of J-STD-002, Solderability Tests for Component Leads, Terminations, Lugs, Terminals, and Wires, Category 3.

Sub-Tier Flow Down — Requirements of this code shall be flowed down to sub-tier suppliers.

18QC36 ESD Packaging

The part is considered to be sensitive to electrostatic discharge. All containers and paperwork must be marked accordingly. All leads must be shorted by material having resistivity less than one tera OHM/Square. Packing should provide the necessary protection during shipping.

18QC37 Packaging for International Shipment

The items supplied under this order will be shipped internationally. Packaging shall comply with standard practices of the industry to ensure safe delivery of the material without marks, scratches, dents or other damages as well as provide a means to prevent corrosion from moisture and salt. All wood packing shall meet the requirements of ISPM-15 and be stamped with the approved IPPC stamp prior to shipping.

18QC38 Explosive Packaging and Delivery

This order requires the inner packaging of explosive items to be non-countermining, also termed non-propagating, and each section will have a Maximum Creditable Event (MCE) of 3.0 grams of DoD Class 1.1 explosive material.

18QC39 Soldering

Any or all of the following standards may apply:

- J-STD-001 Class 3 requirements for Soldering.
- IPC-A-610 Class 3 requirements for Solder.
- Solderability of printed wiring boards must meet the criteria of J-STD-003 Category 3.
- Solderability of electronic and mechanical components and wires must meet the criteria of J-STD-002.
- Category 2 (Typical Coating Durability.) Samples shall be preconditioned using Condition Category E (4 hour bake at 155 C)."
- Fluxes shall meet the requirements of J-STD-004, Types RO, RE, or OR and activity levels L0 or L1.
• Solder bar shall meet the requirements of J-STD-006.
• Solder wire shall meet the requirements of J-STD-004 and J-STD-006.
• Solder paste shall meet the requirements of J-STD-004, J-STD-005, and J-STD-006.

18QC40  **Purchase Order Review**

NGIS requires an initial review of this purchase order with the supplier (Form QA-F009). Upon issuing the purchase order the NGIS buyer will schedule the purchase order review. During the review NGIS will address all requirements and supplier questions regarding the order. The review may occur at the supplier’s site, at NGIS, or by teleconference.

18QC41  **Quality and Inspection System Requirements**

The supplier shall comply with Military Specification, MIL-Q-9858, Quality Program Requirements and MIL-I-45208, Inspection System Requirements or ISO 9001:2008 – Quality Management System Requirements. During the performance of this order, your quality control or inspection system and manufacturing processes are subject to review, analysis, and verification by NGIS Mission Assurance/Quality Representative.

18QC42  **SPC Document Submittal**

The use of Statistical Process Control (SPC) is a requirement of this order. The SPC techniques recommended for use are defined in the American Society of Quality Control (ASQC) documents, B.1, and B.3.

The supplier shall submit a Process Control detail plan as part of the PCD containing the following elements, as a minimum.

• A completed NGIS Process Control detail plan (Form SC-F006 or a NGIS approved equivalent).
• A description of the system to be used for identifying out-of-control conditions to NGIS and for the submittal of a corrective action plan to remove such conditions.
• A listing of implementation/improvement milestones for achieving the NGIS recommended minimum capability ratio (Cpk) of 1.33 for major and special characteristics and 2.0 for critical characteristics.
• Use of SPC does not eliminate the requirement for inspection per the contract unless otherwise specified within your purchase order.

If SPC is not used for required critical, major, or special characteristics, the supplier shall identify those characteristics and the alternate method of control in the PCD and detail plan (column I on Form SC-F006).

The supplier shall not submit SPC data with this order unless specifically requested to do so in the PO.
NGIS reserves the right to monitor the supplier’s SPC program/performance at the supplier’s facility via surveillance or audit for those processes or characteristics controlled by SPC.

**18QC43 Critical Characteristic Control Plan**

Prior to production, the supplier shall prepare and submit a “control plan” for critical characteristics listed in the classification of characteristics or referred to in applicable specifications.

While product is under supplier control, NGIS assumes no liability resulting from any subcontractors’ property damage, injuries, death, or other causes of action that arise or may arise from the subcontractors’ development, use of and/or reliance on such a “control plan,” whether formally or informally approved by NGIS.

The control plan for critical characteristics must include, as a minimum:

- Source and revision of supporting detail work instructions
- Requirements for training, testing and certification of operators and inspectors
- How critical nonconformances are to be detected
- Required actions and notifications when a critical nonconformance is detected
- Corrective action and follow-up
- How suspect product and nonconforming units will be separated from, and remain separated from, conforming product
- How nonconforming units will be dispositioned
- Criteria for an acceptable effectiveness level
- How verification of the plan’s effectiveness is performed
- Actions required when one or more of the effectiveness levels are exceeded
- Reporting (including format, frequency/timing, and distribution) of: effectiveness levels when a critical nonconforming condition is detected, activities during corrective action(s)
- Authority for initial start, stoppage, and restart of production.

Other listed characteristics shall be controlled in accordance with contract and specification requirements and may include all of the above elements. NGIS reserves the right to disapprove the control plan.

**18QC44 Classification of Characteristic Requirements**

The NGIS classification of characteristics or inspection procedure attached to this purchase order shall be used in establishing an inspection program. Acceptance of the product shall be based upon inspection at NGIS unless otherwise stated in the purchase order.

**7.0 RECORDS**

Records must be maintained per MA-0500, Control of Records and the Records Retention Schedule.
8.0 FORMS

**QA-F007**  Supplier Request for MRB (SR-MRB)
**QA-F009**  Supplier Purchase Order/Build Readiness Review Checklist
**QA-F012**  Supplier Consent to Ship Checklist
**SC-F006**  Process Control Detail Plan

9.0 REFERENCES

**MA-0500**  Control of Records
**SAE AS9100**  Aerospace Standard Quality Management System Requirements for Suppliers
**ISO/TS16949**  Automotive Quality System Certification
**AS9102**  Aerospace First Article Inspection Requirement
**ISO 10012**  Calibration System Requirements
**ISO/IEC 17025**  National Institute of Standards and Technology
**ANSI/NCSL Z540-1**  Calibration Laboratories and Measuring and Test Equipment-General Requirements
**FAR 52.245-1**  Government Property
**D950-11059-1**  Boeing BDS Seller Special Tooling Requirements

10.0 ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>AIE</td>
<td>Acceptance Inspection Equipment</td>
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<tr>
<td>AQL</td>
<td>Acceptance Quality Level</td>
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<tr>
<td>ASL</td>
<td>Approved Supplier List</td>
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<td>ASQC</td>
<td>American Society of Quality Control</td>
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<tr>
<td>BRR</td>
<td>Build Readiness Review</td>
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<tr>
<td>CAR</td>
<td>Corrective Action Request</td>
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<td>CARC</td>
<td>Chemical Agent Resistant Coating</td>
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<td>CoC</td>
<td>Certificate of Conformance</td>
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<tr>
<td>COTS</td>
<td>Commercial Off The Shelf</td>
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<tr>
<td>CTS</td>
<td>Consent-To-Ship</td>
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<tr>
<td>DCMA</td>
<td>Defense Contract Management Agency</td>
</tr>
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<td>DFMEA</td>
<td>Design Failure Mode Effects Analysis</td>
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<tr>
<td>DOE</td>
<td>Design of Experiments</td>
</tr>
<tr>
<td>ESD</td>
<td>Electrostatic Discharge</td>
</tr>
<tr>
<td>FAAT</td>
<td>First Article Acceptance Test</td>
</tr>
<tr>
<td>FAI</td>
<td>First Article Inspection</td>
</tr>
<tr>
<td>GSI</td>
<td>Government Source Inspection</td>
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<tr>
<td>IPPC</td>
<td>International Plant Protection Convention</td>
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<td>IQUE</td>
<td>In-Plant Quality Evaluation</td>
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<td>LOD</td>
<td>Letter of Delegation</td>
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<td>MCE</td>
<td>Maximum Creditable Event</td>
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<td>MQE</td>
<td>Manufacturing Quality Engineer</td>
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<td>MRB</td>
<td>Material Review Board</td>
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This document is not controlled when printed or downloaded. Refer to on-line status for latest revision.
<table>
<thead>
<tr>
<th>Rev.</th>
<th>Date</th>
<th>Description of Change</th>
<th>Prepared By</th>
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<tbody>
<tr>
<td>—</td>
<td>4 December 2016</td>
<td>Initial release — Replaces 28066061 and N-W-7-4401</td>
<td>Elizabeth Theesfeld</td>
</tr>
<tr>
<td>1</td>
<td>9 February 2017</td>
<td>Modify the language in 18QC02 to require suppliers to return a copy of the approved nonconformance report instead of the SRMRB form. Plus a few other minor typos; one in 18QC02, and the other in 18QC035.</td>
<td>Austin Overman</td>
</tr>
<tr>
<td>2</td>
<td>25 July 2017</td>
<td>Reinstated 18QC09 Control Plan. Changed 18QC01 to Mesa Use Only and added new code 18QC01P — same words as 18QC01 but for Plymouth Use Only.</td>
<td>Mary Gilroy</td>
</tr>
<tr>
<td>3</td>
<td>23 October 2017</td>
<td>Updated 18QC05. Added sentence: “Parts shall be clearly identified and segregated by part number. Multiple part numbers and differing revisions shall not be mixed in the same container.”</td>
<td>Troy Dawson</td>
</tr>
<tr>
<td>4</td>
<td>13 December 2018</td>
<td>Update company name from Orbital ATK to Northrop Grumman Innovation Systems.</td>
<td>John Toedter</td>
</tr>
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</table>

It is the responsibility of the reader to review the changes to this document. Contact the Process Owner for further clarification.