

TEXTRON Systems

AAI CORPORATION **D/B/A**
TEXTRON SYSTEMS

SUPPLIER QUALITY ASSURANCE
REQUIREMENTS (SQAR)

QA-SP47 (Rev. **K**)

UNCONTROLLED IF PRINTED.

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NOTE: The change history of this process guide can be found at the end of this document.

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1. INTRODUCTION

- 1.1. **Textron Systems**/AAI is committed to working with Suppliers to ensure customer satisfaction through conformance to Quality requirements, competitive costs, improved communication, reduction of variation, elimination of non-value added work, and meeting delivery expectations. **Textron Systems**/AAI intends to establish and maintain long-term relationships with Suppliers who are committed to continuous improvement in quality, delivery, cost and service. This commitment is an expectation of all Suppliers. Those Suppliers who embrace this philosophy will best position themselves for future opportunities including the possibility of strategic and long-term relationships with **Textron Systems**/AAI. As we explore new markets, we look to our entire supply base for the support and commitment needed to meet or exceed our customer's needs. We believe that evidence of a commitment to continuous improvement includes **ISO 9001, ISO 14001**, and/or AS9100 certification, proactive supply chain management, productivity improvements and frequent cost-saving proposals. In turn, **Textron Systems**/AAI will deal honestly with our Suppliers, strive to listen to our Suppliers concerns, communicate our requirements and provide our Suppliers with the appropriate tools to perform at world-class levels. We look forward to mutually beneficial, long term relationships with our Suppliers.

2. SCOPE

- 2.1. This Supplier Quality Assurance Requirements (**SQAR**) document defines specific terms and conditions, including supplier restrictions and quality system requirements applicable when goods and services are procured to **Textron Systems**/AAI part numbers (defined by receipt of a **Textron Systems**/AAI drawing and/or specification), or Government, Military, Federal, or Industry specifications or standards. It describes the minimum requirements and processes that are requirements of **Textron Systems**/AAI's purchase orders and subcontracts.

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3. DEFINITIONS/ACRONYMS

- 3.1. **PURCHASE ORDER (PO):** The commercial document issued by a Buyer to a Seller, indicating types, quantities and agreed prices for products or services. Also referred to as "order."
- 3.2. "BUYER" shall mean AAI Corporation DBA Textron Systems via its duly authorized Procurement representative (Subcontract Manager or Buyer) as stated in the Purchase Order (PO) or subcontract document.
- 3.3. "SELLER" shall mean the supplier. The supplier is the entity to whom the **Textron Systems/AAI** PO or subcontract (hereinafter "order") is awarded (this includes, but may not be limited to; manufacturers, distributors, brokers, designers, and other service providers) performing the work or supplying the contract items specified by the order. Such contract items may include, but are not necessarily limited to; raw materials, finished parts, assemblies, subassemblies, subsystems, commercial off the shelf (COTS) items or services of all types.
- 3.4. **FIRST ARTICLE INSPECTION (FAI)** is intended to provide objective evidence that all engineering, design and specification requirements are correctly understood, accounted for, verified, and recorded. FAI is intended to ensure that planning, work instructions, material processing systems and controls, tools, gages, and fixtures, inspection/test equipment will produce an item in compliance to the applicable purchase order, drawing and specification requirements.

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4. GENERAL REQUIREMENTS

- 4.1. APPLICABILITY – These general requirements shall apply to Sellers whenever this SQAR is incorporated into the requirements of an order by reference. In addition to specific written terms and conditions, “Purchase Order Code 4M” signifies incorporation of this SQAR into an associated order. Other variable requirements specific to the PO shall be identified as additional quality requirements with the applicable Quality Code and are incorporated by reference when specified on the order.
- 4.2. All purchase order codes can be found at <http://www.textron.com/who-we-are/supplier-information/supplier-quality>.
- 4.3. Applicable revision status of such specifications shall be the revision in **effect** on the date of the **PO** unless specified in the **PO** or related documents. Revision status of procured/deliverable items shall always be as specified in the Order. If the **PO** conflicts with the requirements of this document, the **PO** requirement will supersede this document.

5. SUPPLIER'S QUALITY SYSTEM REQUIREMENTS

- 5.1. The Seller should implement a quality management system (QMS) which complies with International Organization for Standardization (ISO) 9001, AS9100 or a system approved by Textron Systems/AAI. The Seller should employ advanced quality techniques and tools which foster continuous improvement of Seller's products including services, distribution, fabrication and assembly processes.

6. PROCESS REVIEW

- 6.1. Textron Systems/AAI reserves the right to perform process reviews at Seller's facility based on risk, which Seller agrees to support, without cost to Buyer. Such reviews shall be scheduled in advance on a non-interference basis. The purpose of a process review is to determine the suitability, adequacy, effectiveness and consistency of the supplier's processes to meet contractual requirements and to provide a basis of confidence for product/service acceptance. Process reviews address the five key elements of a process (4M+E) necessary to produce the product.
 1. Manpower (training, skills, personnel changes, certifications)
 2. Material (correct materials, shelf life, nonconformance control)
 3. Methods (appropriate inspection points, work instructions, routings, records, corrective actions)
 4. Machinery (tools, fixtures, calibration)
 5. Environment (temperature, lighting, safety, security)

If conducted, the Seller shall have available, and will present upon request, process records relevant to items on the order. A copy of the process review form is available on the supplier website at <http://www.textronsystems.com/who-we-are/supplier-information/supplier-quality>

7. INDUSTRY SPECIFICATIONS AND STANDARDS

- 7.1. For all Military, Federal, and Industry specifications and standards specified by the Drawing, Specification, order, or applicable statutory and regulatory requirements, the Supplier shall comply with the revision in effect at the time the **Textron Systems/AAI** order is awarded. **Textron Systems/AAI** reserves the right to request a different revision **than** that specified on the order.
- 7.2. The requirements of **Textron Systems/AAI's** PO, including applicable drawings (including specific drawing notes and annotations), specifications and statements of work (SOW) supersede workmanship specifications and standards of the Seller including those specifications and standards represented as "Industry **Standards.**" If the Seller believes a drawing contradiction exists, the Seller is obligated to procure a clarification via written correspondence to **Textron Systems/AAI**. The clarification shall be issued by Textron Systems/AAI in writing through a drawing revision, PO amendment, Material Review Board (MRB) disposition, or another official notification when originated from the Textron Systems/AAI Procurement representative. **No contractual direction from any Textron Systems/AAI employee except the cognizant Procurement representative shall be binding. If Seller accepts direction from other than the Procurement Representative, it does so explicitly at Seller's own risk.**

8. ALTERING DATA ON DOCUMENTS

- 8.1. The use of any method that causes the original data on documents to be obliterated and unreadable (i.e. the use of correction fluids, correction tape, write-over, or other methods) to correct, modify or otherwise alter the data and/or entries on any certifications, test reports or other documents required by the Contract, is strictly prohibited. Corrections may be made on inspection reports providing it is clearly obvious that a correction was made and it is signed, initialed, or stamped by an authorized individual. Upon receipt at **Textron Systems/AAI**, products or services represented by documents that show evidence that they have been corrected or altered in an unauthorized manner are subject to return to the Supplier.

9. WORK INSTRUCTIONS

- 9.1. Suppliers shall maintain work instructions or equivalent control mechanisms that **clearly specify** procedures and processes appropriate for the control of quality and configuration through all stages of production.

10. SUPPLIER CONTROL

- 10.1. The Seller, as the recipient of the Purchase Order, is responsible for meeting all specified technical and quality requirements, whether the Seller performs the work, or the work is performed by the Supplier's sub-tier sources. When the Supplier uses sub-tier sources for components or to perform work on products and/or services scheduled for delivery to **Textron Systems/AAI**, the Seller shall flow-down, to Seller's sub-tier sources, all of the applicable technical and quality requirements of the Textron Systems/AAI Purchase Order. **Flow down shall include**, when applicable, the requirement to document and control 'key/critical characteristics' and/or 'key processes', and to furnish certifications and test reports required by the applicable Purchase Order requirements.

11. CORRECTIVE ACTION SYSTEM

- 11.1. The Supplier shall have a functioning system for closed loop corrective action. Seller agrees to provide to the Buyer (Textron Systems/AAI Buyer and/or Textron Systems/AAI Supplier Quality) corrective action using Buyer's Form M-803 (Supplier Corrective Action Request (SCAR)) within 30 days from issuance of a SCAR. Supplier forms will not be accepted **unless functionally equivalent**. At a minimum, the corrective action response shall include:
- 11.1.1. A thorough failure/root cause analysis identifying the cause(s) for the discrepancy(ies), **failures, missing documentation** etc. noted.
 - 11.1.2. Determination and execution of the necessary corrective action(s) to prevent recurrence.
 - 11.1.3. Identification of whether any previous shipments for the subject or similar parts contain or may contain the noted discrepancy.
 - 11.1.4. Identification of the effectivity of the corrective action(s) (e.g., implementation date, lot number, etc).
 - 11.1.5. The failure/root cause analysis should be conducted using techniques such as 5-Why's, Cause and Effect/Fishbone diagrams, Fault Tree diagrams, 8D, etc.

12. NONCONFORMING MATERIAL CONTROL

- 12.1.1. **Textron Systems/AAI is under no obligation to accept nonconforming products from Suppliers; approval will be granted (or denied) by Textron Systems/AAI and its Customer through a Material Review Board (MRB) activity.**
- 12.1.2. **Textron Systems/AAI reserves the right to request equitable adjustments based on items that are nonconforming or otherwise not complete, accurate, and or current as specified on the order.**

12.1.3. Nonconforming material shall be identified, documented, evaluated, segregated and dispositioned to prevent its unintended use. Unless otherwise stated in the Order, the Seller is authorized to conduct limited Material Review and disposition of nonconforming products identified by the Seller using the following disposition alternatives:

- rework to applicable requirements,
- scrap, or
- RTV – return to (the Supplier's) sub-tier source for rework or replacement.

12.2. Nonconforming products are defined as any products that fail to meet the requirements of the **Textron Systems**/AAI engineering drawing, specification, Purchase Order or other approved product description, including, at **Textron Systems**/AAI's discretion, products (such as products under the Supplier's proprietary design control) which fail to meet requirements established and controlled by the Seller or the Seller's sub-tier sources.

12.2.1. The Seller may propose and formally request a "use-as-is" or repair (salvage) disposition by submitting Form M-798, "Supplier MRB Disposition Request" found at http://www.aaicorpextronsystems.com/contact_us/Suppliers.html,who-we-are/supplier-information/supplier-quality to the **Textron Systems**/AAI Buyer. The Seller's Material Review and nonconforming product disposition records, as well as the Material Review records at the Supplier's sub-tier sources are subject to on-site verification by **Textron Systems**/AAI to ensure that the Seller follows these requirements.

12.2.2. At **Textron Systems**/AAI's discretion, root cause analysis must be conducted using techniques such as 5- Why's, Cause and Effect/Fishbone diagrams, Fault Tree diagrams, 8D, etc. Supplier MRB Disposition Requests that do not contain effective analysis may be returned to Seller without action.

12.3. **The Seller shall not repair or ship to **Textron Systems**/AAI any nonconforming products prior to **Textron Systems**/AAI MRB approval unless authorized by **Textron Systems**/AAI Buyer in writing.** When **Textron Systems**/AAI MRB dispositioned products are delivered to **Textron Systems**/AAI, the Seller shall reference on the packing list/shipper the MRB document which describes the **Textron Systems**/AAI MRB disposition. When the Supplier's shipment includes products dispositioned by **Textron Systems**/AAI MRB along with conforming products, the products dispositioned by **Textron Systems**/AAI MRB shall be segregated and marked or tagged so as to permit easy identification upon receipt at **Textron Systems**/AAI. **The acceptance of nonconforming parts by **Textron Systems**/AAI and its Customer establishes no precedent for the continued acceptance of parts in similar condition.**

13. CALIBRATION SYSTEM

13.1. Seller test and measurement equipment services shall have a calibration system in compliance with the requirements of MIL-STD-45662A, ISO 10012, ISO 17025 or ANSI/NCSS Z540. Calibration procedures must be maintained which provide sufficient information for periodic calibration of inspection, measuring, and test equipment (IM&TE).

14. SHELF LIFE MATERIAL CONTROL PROGRAM

14.1. Where supplier deals with shelf life materials subject to degradation or deterioration over time, the supplier shall establish a shelf life and storage control program to ensure that no material that has exceeded its shelf life, at the time of assembly, can be used in the assembly of **Textron Systems**/AAI product. Such a program shall include policies and procedures for:

14.1.1. Identifying all items (contained in the Bill Of Material (BOM) of product to be delivered to **Textron Systems**/AAI) that have shelf life limitations and/or special storage requirements.

14.1.2. A receiving inspection (**RI**) process that can ensure that all incoming products are within their shelf life limitation period.

14.1.3. A process for physically identifying, labeling, or coding each item so that its shelf life can be readily determined and stating that the item is under shelf life control.

14.1.4. A procedure(s) for reviewing (auditing) the status of all items under shelf life controls both in stock and previously issued items/products.

14.1.5. Identifying and tracking repackaged consumables. This should include all appropriate information, such as part number, batch number, receiving information (for tracking), date opened, and expiration date. Note: Repackaged consumables with shelf life/storage condition requirements, on which the status cannot be verified, should be properly disposed of.

15. PRODUCT CHANGES

15.1. Seller shall not make any changes in material(s), software, design, manufacturing source(s), process(es) and tooling, which potentially affects the fit, form, or function of the item for items on **the order** without notification to the Buyer. Production parts fabricated in advance of Buyer approval shall be at the Seller's risk. **Requested changes** must be made using "QAPG-QE63 FM1 Item Change Request Form" and submitted to the Buyer. This document can be found at <http://www.textronsystems.com/who-we-are/supplier-information/supplier-quality>

15.2. The Seller's change control system shall assure that the latest applicable drawings, specifications, technical requirements, order information and changes thereto will be available at the time and place of acceptance of material and/or services.

15.3. **The** Buyer reserves the right to test the changed hardware in its system or by using simulators to verify the compatibility of changed hardware prior to accepting said hardware or changes. This includes full re-qualification if necessary.

16. CRITICAL SAFETY ITEM (CSI) PROGRAM

- 16.1. When the Supplier is manufacturing an item designated by **Textron Systems**/AAI on a drawing or PO (Purchase Order Code "CSI") as a Critical Safety Item (CSI), the Supplier is responsible for complying with and shall support implementation of the requirements of the CSI program described in QA-SP65, "Critical Safety Item (CSI) Program Activities." This document can be found at <http://www.textronsystems.com/who-we-are/supplier-information/supplier-quality>. Refer to the "Procured Part Revision Control Document" provided with the Purchase Order for the current CSI Control Plan number and revision.

17. SUPPLIER FIRST ARTICLE INSPECTION (FAI)

- 17.1. When the Supplier is manufacturing a production **Textron Systems**/AAI part with a First Article Inspection (FAI) requirement identified on the PO (Code "B9"), an FAI is required in accordance with the requirements of AS9102, "Aerospace First Article Inspection Requirement." In addition to the top assembly, subassemblies that are part of the top assembly shall be included in the FAI report according to "Supplier Instruction QA-SP52 Supplier First Article Inspection Instructions" located at <http://www.textronsystems.com/who-we-are/supplier-information/supplier-quality>.
- 17.2. The Seller shall submit a Source Inspection Request, **Textron Systems**/AAI Form #M-791 to **the individuals noted on the form**, 7 days prior to the commencement of the FAI. The FAI shall be completed prior to product acceptance and shipment to **Textron Systems**/AAI unless other instructions are provided by the Purchase Order, Statement of Work, or other **direction provided by Buyer**. Should any of the following conditions apply since the last build of an **Textron Systems**/AAI part numbered product with a previously completed FAI, the Supplier shall perform a full or partial FAI in accordance with AS9102 requirements:
- A change in the design affecting fit, form or function of the part.
 - **Textron Systems**/AAI initiated design changes are represented by a change of the PO item Rev number (example: Rev 001 changes to Rev 002).
 - A change in manufacturing source(s), process(es), inspection method(s), location of manufacture, tooling or materials, that can potentially affect fit, form or function.
 - A change in numerical control program or translation to another media that can potentially affect fit, form or function.
 - A natural or man-made event, which may adversely affect the manufacturing process.
 - A lapse in production for two years.

18. COMPONENT OBSOLESCENCE MANAGEMENT

- 18.1. The Supplier shall develop, document and implement an electronic component management process that addresses all aspects of the product life cycle from design through service, including component selection, application, and standardization and obsolescence management. Supplier's program shall address the following issues:

18.1.1. In the event that a component becomes obsolete or otherwise unprocurable, the Supplier's obsolescence management process shall include provisions for alternate parts, end-of-life buys, and/or upgraded parts.

18.1.2. When alternate parts are being considered, parts shall be selected from alternate sources, which are form, fit, and function replacements and meet the same quality, reliability, and selection criteria as the original parts.

- Note that form-fit-function alternate parts that require modification to the printed wiring board layout also require **Textron Systems/AAI** approval.

18.1.3. When end-of-life buys are being considered, the Supplier shall formally notify **Textron Systems/AAI** of its intent and the lifetime buy requirement shall be negotiated and approved by **Textron Systems/AAI**.

18.1.4. When alternate parts cannot meet form-fit-function requirements or when upgraded parts are being considered, the Supplier shall formally notify **Textron Systems/AAI** of its intent and shall provide a detailed engineering analysis of the re-screening or testing requirements which will provide form-fit-function equivalency to the original parts. Note that form-fit-function alternate parts that require modification to a printed wiring board layout also require **Textron Systems/AAI** approval.

18.2. The Supplier's analysis report to **Textron Systems/AAI** for upgraded parts shall substantially respond to the following questions:

- Reason for change
- Will the component be substituted into a critical function?
- List equipment in which new component will be used, and the quantities of each
- Existing component part number
- Existing component rated temperature range
- Operating temperature environment
- Existing component quality assurance process, e.g. MIL-SPEC screening, etc.
- New component Part Number
- New component rated temperature range
- Operating temperature requirement
- New component quality assurance process, e.g. MIL-SPEC, screening, etc.
- What is impact of the substitution on equipment reliability and safety?
(Report analysis results)
- Briefly describe the analysis and results that show the new component will be reliable in this application e.g., in-service data, etc.

18.3. In the case of out-of-production equipment where obsolescence issues render the equipment to be unsupported, **Textron Systems/AAI** shall be notified of the circumstances that caused the product to be unsupported. **Textron Systems/AAI** and the Supplier will work together to provide timely, accurate, standardized communications to notify customers of an impending product obsolescence and/or discontinuance.

19. NOTIFICATIONS/DISCLOSURES

- 19.1. The Supplier's system shall provide for timely reporting of nonconformities that may affect product already delivered, including any continuing air-worthiness actions. Notification to the Buyer shall include a clear description of the discrepancy, identification of all suspect parts (to include mfg. dates, serial numbers, quantities, etc.) and material affected by the deficiency, date(s) delivered, any information relating to the Root Cause/Corrective Action (RCCA) steps initiated to address the defective condition, and preventive measures taken to preclude recurrence of the process failure. Modifications of a disclosure (additions or deletions of data) requiring subsequent issuances shall be revision controlled to provide definitive sequencing (i.e. Rev 'A', 'B' etc.).

20. EXCEPTION TO REJECTIONS

- 20.1. In the event a Supplier does not accept the responsibility for a discrepant condition, the Supplier may complete **Textron Systems**/AAI Form M-816 to their Buyer. The form can be accessed at <http://www.textronsystems.com/who-we-are/supplier-information/supplier-quality>

21. SOFTWARE AND HARDWARE CONFIGURATION MANAGEMENT

- 21.1. The Supplier shall implement and maintain a configuration management (CM) process which includes CM planning, identification, change control, status accounting and CM audits for all product independent to product life cycle (unless clearly identified on the PO). (See ISO 10007 for guidance.)
- 21.2. For all products including software and/or firmware, the Seller shall implement a Software Configuration Management (SCM) system which includes CM planning, identification, change control, status accounting and CM audits for all product independent to product life cycle (unless clearly identified on the PO).
- 21.3. The Seller shall implement a Corrective Action / Problem Tracking System to track software and/or firmware problems/corrective actions to closure.

22. COUNTERFEIT PART AVOIDANCE

22.1. Definitions

- Original Component Manufacturer (OCM) /Original Equipment Manufacturer (OEM) – The supply chain entity who designs and controls the manufacture of an item. The OCM/OEM warrants performance of the item to its published specifications.
- Franchised/Authorized Distributor – A Seller that that has a contractual relationship with the OCM/OEM to buy, stock, re-package and sell its

product lines. A Franchised/Authorized Distributor offers the OCM/OEM's full flow through warranty including failure analysis and corrective action support.

- Independent distributor/broker – Any Seller that does not have a contractual relationship with the OCM/OEM to stock and sell its products.

22.2. Seller shall develop and implement a comprehensive counterfeit parts and assembly avoidance control plan to prevent the introduction of counterfeit parts and assemblies into items delivered to **Textron Systems**/AAI. The plan shall comply with the requirements of AS5553 Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition.

22.3. Incorporation of components or assemblies purchased from other than the OCM/OEM or a franchised/authorized distributor shall be submitted to the Buyer for approval and shall include:

- Furnish unbroken documentation (Certificate of Conformance (**CoC**)) of part traceability to the part/assembly OCM/OEM if available.
- Provide inspection, x-ray, Destructive Physical Analysis (DPA) and testing by a third party PRIOR to acceptance by the Buyer if traceability to the OCM/OEM is not available.

22.4. All of the above counterfeit parts avoidance requirements shall be flowed down to sub-tier Suppliers.

22.5. If suspect/counterfeit parts are furnished under the Order and are found in any of the goods delivered hereunder, such items will be impounded by Buyer. The Seller shall promptly replace such suspect/counterfeit parts with parts acceptable to the Buyer and the Seller shall be liable for all costs relating to the removal and replacement of said parts. The Seller shall make replaced suspect/counterfeit parts available for further investigation. Seller agrees that any reporting and investigation service, such as **Electronic Resellers Association International** (ERA) or a **Government Industry Data Exchange Program** (GIDEP) alert, indicating that such parts are counterfeit, shall be deemed definitive evidence that Seller's parts contain counterfeit parts.

**APPENDIX A
Change History**

Version	Date	Author	Description
H	10/2/13	Paul Fishburn	Removed requirements for JEDIC and IDEA from paragraph 22.3.
J	9/30/15	Mike Nussbaum	Added "at TEXTRON SYSTEMS/AAI's discretion" to paragraph 12.2. nonconforming product definition.
K	3/2/17	Mike Nussbaum	Updated paragraphs for General and Supplier Requirements, Corrective Action System, Nonconforming Material Control, FAI and Exception to Rejections, removed some wordiness and defined more terms.