

**Supplier Quality Manual  
SAI-103**

**Spectrum Associates, Inc.  
183 Plains Road  
Milford, CT 06461**

**440 New Haven Avenue  
Milford, CT 06460**

**Revision A  
October 5, 2018**

Approved By:   
Peter Jackson – Operations Manager

11/09/2018  
Date

Approved By:   
Robert Salerno – Quality Manager

11/09/2018  
Date

**SAI-103 SUPPLIER QUALITY MANUAL - REVISION HISTORY**

DATE	REV.	DESCRIPTION OF CHANGES
12/1/17	First Issue	
11/05/18	REV. A	Added Notice of Nonconforming Product Escape to 14.0 Added "When Specified by "Q" Clause (See Form D-1124) on Purchase Order" statement to para.5.8, 6.1, 6.2, 6.3, 12.2, 12.3, 13.7, 17.6, 22.0 and 23.0

<b>Index</b>	<b>Page</b>
<b>1.0 COMPANY OVERVIEW</b>	<b>4</b>
<b>2.0 SPECTRUM'S MISSION</b>	<b>4</b>
<b>3.0 INTRODUCTION</b>	<b>4</b>
<b>4.0 SUPPLIER CODE OF CONDUCT</b>	<b>4</b>
<b>5.0 QUALITY MANAGEMENT SYSTEM (QMS) REQUIREMENTS</b>	<b>5</b>
<b>6.0 FEDERAL AVIATION ADMINISTRATION (FAA) REGULATIONS</b>	<b>7</b>
<b>7.0 BUSINESS CONTINUITY PLANNING/ WORK TRANSFER</b>	<b>8</b>
<b>8.0 UNAUTHORIZED PRODUCT REPAIRS &amp; SALVAGE</b>	<b>8</b>
<b>9.0 UNAUTHORIZED PRODUCT CHANGES OR SUBSTITUTIONS</b>	<b>8</b>
<b>10.0 ALTERING DATA ON DOCUMENTS</b>	<b>8</b>
<b>11.0 CONTRACT / P.O. CHANGES</b>	<b>9</b>
<b>12.0 PRODUCT QUALIFICATION</b>	<b>9</b>
<b>13.0 PROCESS CONTROL</b>	<b>9</b>
<b>14.0 CONTROL OF NONCONFORMING MATERIAL/ NOTICE OF NONCONFORMING PRODUCT ESCAPE</b>	<b>12</b>
<b>15.0 COUNTERFEIT AND SUSPECTED UNAPPROVED PARTS PREVENTION PROGRAM</b>	<b>12</b>
<b>16.0 FOREIGN OBJECT AND DEBRIS (FOD) PREVENTION</b>	<b>13</b>
<b>17.0 PRESERVATION, PACKAGING, LABELING, DELIVERY AND CERTIFICATES OF COMPLIANCE</b>	<b>13</b>
<b>18.0 RECORD RETENTION</b>	<b>14</b>
<b>19.0 CONTINUAL IMPROVEMENT</b>	<b>14</b>
<b>20.0 PROBLEM SOLVING PROCESS</b>	<b>14</b>
<b>21.0 CORRECTIVE ACTION REQUESTS</b>	<b>14</b>
<b>22.0 SOURCE INSPECTION</b>	<b>14</b>
<b>23.0 GOVERNMENT SOURCE INSPECTION (GSI)</b>	<b>15</b>
<b>24.0 SUPPLIER PERFORMANCE MEASUREMENTS</b>	<b>15</b>

## 1.0 COMPANY OVERVIEW

Spectrum Associates, Inc. (SAI) is a leader in quality manufactured fluid control instrumentation, breakaway fuel valves, and other products for the defense, aerospace and commercial aircraft industry. Established in 1957 as a new product design and development company, Spectrum has made notable advances in diversified technologies, positioning the company to its current status as a prominent engineering-oriented quality manufacturer.

## 2.0 SPECTRUM'S MISSION

Spectrum Associates is committed to providing our customers with premier customer service. This means meeting customer requirements for product quality and on time delivery every time. It also means anticipating our customers' future needs and expectations for new products with innovative designs. Spectrum aims to accomplish these objectives with strong leadership, a highly capable and empowered workforce, and partnering with best-in-class Suppliers.

**Web Page:** Additional information about Spectrum, the latest version of this document and supplier purchase order quality assurance clauses (Form D-1124) can be found at:

[www.spectrumct.com](http://www.spectrumct.com)

## 3.0 INTRODUCTION

### 3.1 Providers of Goods and Services (Suppliers):

Spectrum Associates recognizes the very important role our Suppliers have in the value we offer our customers. As an extension of our own operations, we rely on our Suppliers to provide material, products, and services which meet all of the requirements of Spectrum contracts, applicable specifications, applicable regulatory requirements and the quality management requirements outlined herein.

### 3.2 Purpose:

The purpose of this manual is to inform Spectrum Suppliers of our expectations regarding the Suppliers' quality management systems and manufacturing process controls required for the purpose of doing business with Spectrum. This manual describes what Spectrum expects its Suppliers to do to ensure that all requirements and expectations are met.

### 3.3 Scope:

This manual applies to all Suppliers providing Spectrum with materials, products, processing, and related services, and when applicable, to Supplier sub-tier sources. The general requirements outlined herein do not supersede conflicting requirements in the Spectrum purchase order, contract, industry and regulatory requirements, specifications or drawing, including applicable engineering specifications.

### 3.4 Requirements:

In this manual, the terms "shall" and "must" mean that the described action is mandatory; "should" means that the described action is necessary and expected with some flexibility allowed in the method of compliance; and "may" means that the described action is permissible or discretionary.

### 3.5 Questions:

Questions concerning this manual should be directed to your respective Spectrum Purchasing Agent.

## 4.0 SUPPLIER CODE OF CONDUCT

### 4.1 General:

Suppliers shall ensure operations are being performed in a manner that is appropriate as it applies to their ethical, legal, environmental, and social responsibilities. Below is a listing of the basic requirements:

### 4.2 Ethical Conduct:

SAI is committed to achieving the highest standards of ethical conduct and ensuring that all Spectrum employees and representatives as well as all Spectrum suppliers act in compliance with all applicable laws and regulations. This includes compliance with all laws, domestic and foreign, prohibiting improper payments or inducements to any person (including Public Officials). SAI employees and representatives are strictly prohibited from accepting any payment or gift of money or anything of value from a supplier, either directly, indirectly or through a third party that is or appears to be inducing or rewarding the employee or representative for accepting improper performance, securing or retaining SAI business. Failure to comply may expose SAI, our employees or representatives, as well as the supplier, to significant criminal and/or civil sanctions.

#### **4.3 Compliance with Local Laws and Regulations:**

Suppliers must adhere to the laws and regulations in the locality in which they reside. This includes all local, state, and federal laws/regulations in the country of origin.

#### **4.4 Compliance with Environmental, Health, and Safety Laws:**

The Supplier must maintain and operate its manufacturing/production facilities and processes in accordance with all local, state, and federal laws/regulations. At no time shall any Spectrum person be exposed to hazardous materials or unsafe conditions as a result of Supplier shipments to Spectrum, or while visiting a Supplier's location. For items with inherent hazards, safety notices must be clearly visible. As applicable, documented safety handling and protection information and equipment (if applicable) must be provided.

#### **4.5 Product Safety:**

In all instances where a product is manufactured to a new design, for a new system, or for a new application, it is important that the Supplier and Spectrum allocate responsibility for assuring that all performance, endurance, maintenance, safety and warning requirements are met. It is preferred that this allocation of responsibility be in writing.

#### **4.6 Non-Discrimination:**

Suppliers shall not discriminate against race, color, sex, religion, age, physical disability, political affiliation, or other defining characteristics as prohibited by local, state, and federal laws/regulations.

#### **4.7 Labor:**

Suppliers shall meet all local, state, and federal labor laws/regulations. They shall employ workers of minimum legal age in accordance with local, state, and federal laws/regulations. Suppliers shall not practice the use of forced or indentured labor.

#### **4.8 Code of Conduct and Policy Enforcement:**

This policy applies to Suppliers and their sub-tier sources. It is the responsibility of the Supplier to verify and monitor compliance of this code at their operations and sub-tier source operations.

#### **4.9 Confidentiality:**

The Supplier shall ensure the confidentiality of Spectrum contracted products and projects under development, and related product information, as well as intellectual property shared as a result of the working relationship, including same at the supplier's sub-tier providers.

### **5.0 QUALITY MANAGEMENT SYSTEM (QMS) REQUIREMENTS**

#### **5.1 General:**

Suppliers shall maintain a Quality Management System (QMS) suitable for the products and services provided to Spectrum. It is preferred that the QMS be certified by an accredited third-party certification body to the latest version of the following:

ISO 9001 - Quality Management System Requirements

AS/EN/JISQ9100 - Quality Management System Requirements (Aerospace)

In the absence of third-party certification, depending on the product, its application, value, and criticality, the Spectrum Quality Department may authorize the acceptance of the Supplier Quality Management System as compliant to the standard or acceptable for the product or application. This may include a Spectrum on-site audit of the Quality Management System before acceptance and inclusion of the supplier on the Spectrum Approved Supplier List (ASL).

#### **5.2 Quality System Manual:**

Upon request, the Supplier shall furnish Spectrum with a copy of the Supplier's Quality Management System Manual, which is to be current and approved by the Supplier's management, including or making reference to related documents. The quality management system documentation shall include the Supplier's statements of a quality policy and quality objectives. Top management shall define quality objectives and measurements which should address customer expectations and be achievable within a defined period of time. The Supplier shall promptly notify the Spectrum Purchasing Agent of any substantive changes to the Supplier's quality management system or personnel.

### **5.3 Spectrum Requires All Suppliers To Provide:**

Immediate notification in the event third party certification has been lost. The Supplier must also provide notification of significant changes within the supplier's organization (e.g., changes related to address, ownership, key management, number of employees, scope of operations).

### **5.4 Supplier Approval Process:**

Spectrum requires all Suppliers to be approved prior to the issuance of Purchase Orders or contracts. All Suppliers must be approved by Spectrum's Quality Department, regardless of approvals by customers or other entities before being added to the Spectrum Approved Supplier List (ASL).

### **5.5 Supplier Assessment:**

#### **5.5.1 Supplier Initial Assessment**

Spectrum may request that the Supplier provide a copy of its quality management system certificate and/or complete a self-assessment of its business and quality management system and capabilities (i.e., quality, delivery, technology, cost, and continual improvement objectives). Any special processes will require assessment as part of the Supplier Approval Process.

#### **5.5.2 Documentation Audit**

In those cases where a Supplier's quality management system has not been certified by an accredited certification body, Spectrum may request a copy of the Supplier's Quality Manual and supporting procedures (and perhaps internal audit reports) to determine if the Supplier's quality management system meets Spectrum requirements.

#### **5.5.3 On-Site Assessment**

Regardless of a supplier's QMS certification status and inclusion on the ASL, Spectrum and/or its customers, may elect to conduct on-site assessments of a supplier at any time. As a result, findings may be issued. It is the supplier's responsibility to correct all findings in an agreed upon timeframe. These on-site assessments could include evaluations of:

5.5.3.1 Product or Process Capability – to determine the Supplier's ability to meet Spectrum's requirements for complex and/or critical products/processes.

5.5.3.2 Quality Management System (QMS) – to determine whether the Supplier's quality management system meets one or more of the applicable standards and is functioning effectively; may occur in conjunction with other on-site assessments. QMS assessments by Spectrum shall occur prior to approval of Suppliers with non-third party certified quality management systems.

5.5.3.3 Business Health Assessment – to determine whether the Supplier has the financial resources, production capacity, and other business resources needed to fulfill Spectrum volume production needs and provide continuity of supply.

5.5.3.4 Continual Improvement Initiative – to determine if the Supplier's culture, methods and skills are favorable to actively pursue continual improvement.

5.5.3.5 Technology Assessment - to determine whether the Supplier has the needed technical resources, including production and inspection equipment, facilities, engineering resources, Spectrum specified computer-aided design language/format, electronic commerce capability, etc.

5.5.3.6 Sub-Tier Supplier Control – to evaluate the effectiveness of the Suppliers sub-tier management processes and ensure that products or services procured from sub-tier sources and delivered to Spectrum conform to all applicable Spectrum requirements.

### **5.6 Contract Review:**

Upon accepting a Spectrum order, the Supplier is responsible for compliance to all engineering drawings, specifications, and purchase order requirements. All documents, drawings, and specifications, regardless of origin, are applicable to the Supplier when specified in the contract or documents referenced in the contract, and are required to be used at all levels of the supply chain. Unless otherwise specified in the contract, the document revision in effect on the date of issue of the contract applies to the contract.

### **5.7 Quality Clauses:**

Each Purchase Order shall contain specific quality program requirements tailored to the product or process that is identified on the order. Each Purchase Order shall define which Quality Clauses (QC) apply. These Quality Clauses are defined on Spectrum form D-1124 which will be attached to each Purchase Order issued for items to be used in product sold to Spectrum customers.

**5.8 Spectrum / Spectrum Customer Designated Sources (When Specified by “Q” Clause (See Form D-1124) on Purchase Order):** When specified in the Purchase Order or Contract, the Supplier shall purchase products, materials or services from Spectrum designated or Spectrum Customer designated sources. However, the Supplier is responsible to ensure that items procured from such sources meet all applicable technical and quality requirements.

**5.9 Access to Supplier and Sub-tier Supplier Facilities:**

The Government, FAA (Federal Aviation Administration) or their representative as well as Spectrum and/or its customer must be granted access to your facility at any time during execution of the order. This requirement applies to and must be flowed down to all sub-tier Suppliers. Audit, surveillance, inspection or tests by Spectrum, its representatives, customer(s), or Government agency does not preclude subsequent rejection by Spectrum or its customers.

**5.10 Control of Sub-Tier Suppliers:**

The Supplier is responsible for meeting all requirements, including work performed by the Supplier's sub-tier Suppliers (also known as subcontract Suppliers). When the Supplier uses sub-tier sources to perform work on products and/or services scheduled for delivery to Spectrum, the Supplier shall include (flow-down) on contracts, to its sub-tier sources, all of the applicable technical and quality requirements contained in the Spectrum contract, including quality system requirements, regulatory requirements, the use of Spectrum or Spectrum customer designated sources, and the requirement to document and control 'key characteristics' and/or 'key processes,' and to furnish certifications and test reports as required. Spectrum, its customers and Government agencies reserve the right-of-entry to suppliers and all sub-tier supplier facilities, subject to proprietary considerations.

**5.11 Risk Management:**

The Supplier shall establish a risk management program that effectively assess those elements from all aspects of the business that could affect the quality of the products and/or services be provided to Spectrum. A copy of the Supplier's risk management program shall be made available to the Spectrum upon request.

**5.12 Control and Release of Spectrum Furnished Documents:**

Documents furnished by Spectrum to the Supplier are furnished solely for the purpose of doing business with Spectrum. Proprietary documents may be furnished to the Supplier in hard copy, electronic or other media. The Supplier is responsible for controlling and maintaining such documents to preclude improper use, loss, damage, alteration and/or deterioration. Unless authorized by the Spectrum Purchasing Agent in writing, the Supplier may not transmit or furnish any Spectrum furnished documents, or copies of such documents, to anyone outside the Supplier's business organization except to a sub-tier source used by the Supplier for performance of work on the Spectrum contract. If requested, Supplier shall return to Spectrum all proprietary documents with the last delivery of products or services on the contract. The Supplier shall flow down this requirement to all sub-tier sources, when such sources will be in receipt of Spectrum proprietary documents during performance of work for the Supplier.

**5.13 Electronic Business Tools:**

**5.13.1 General**

Spectrum is expanding the use of electronic business tools to facilitate day-to-day activities using electronic linkages between Spectrum internal operations as well as with Spectrum Suppliers and customers. Contracts, delivery schedules, notification of product rejections, requests for corrective action, etc. may be transmitted to Suppliers electronically, and Spectrum expects that Suppliers will adopt these tools to reduce errors and improve efficiency.

**5.13.2 Electronic Documents and Signatures:**

The accuracy and authenticity of electronic documents and forms submitted to Spectrum is of highest importance. The use of electronic forms and signatures must be described in and governed by Supplier's documented procedures. Application of electronic signatures must be under the direct control of the individual whose name appears on the electronic document. Electronic signatures may only be applied at the place where the individual is located and the individual must have direct access and responsibility for the products or services described in the electronic document. The application of the electronic signature certifies that the signature (individual) represents an authorized company official.

**6.0 FEDERAL AVIATION ADMINISTRATION (FAA) REGULATIONS**

**6.1 FAA Certification (When Specified by “Q” Clause (See Form D-1124) on Purchase Order):**

When specified on the contract/ P.O., the Supplier shall submit completed FAA Forms, executed in accordance with the requirements of the FAA for work performed.

**6.2 Parts Manufacturer Approval (PMA) Certification (When Specified by “Q” Clause (See Form D-1124) on Purchase Order):** When the contract requires the Supplier to furnish replacement or modification parts, such parts shall be manufactured and certified in accordance with Title 14 CFR Part 21, Subpart K, §21.303. The parts shall be marked in accordance with Title 14 CFR 45, Subpart B, § 45.15 and submitted to Spectrum with FAA Form 8130-3 executed in accordance with FAA Order 8130.21.

**6.3 Anti-Drug and Alcohol Misuse Prevention Program (When Specified by “Q” Clause (See Form D-1124) on Purchase Order):**

If required on the purchase order, all Supplier employees (including any Supplier’s sub-tier employees) performing maintenance or inspection of products with FAA oversight scheduled for delivery to Spectrum shall be included and part of a FAA approved Anti-Drug and Alcohol Misuse Prevention Program. The requirement applies both to pre-employment and random testing of current employees in accordance with the requirements of 14 CFR Part 121, Appendix “I” and Appendix “J”. Evidence of compliance to this requirement shall be made available to Spectrum upon request.

## **7.0 BUSINESS CONTINUITY PLANNING/ WORK TRANSFER**

### **7.1 General:**

The Supplier should have a business continuity plan which would allow for the safeguarding, storage and recovery of engineering drawings, electronic media, and production tooling and equipment in the event of damage or loss. This plan should also contain contingency plans to satisfy Spectrum requirements in the event of loss of key management, facility, significant utility interruptions, labor shortages, and equipment failure.

### **7.2 WORK TRANSFER**

During performance on the Contract, the Supplier shall give Spectrum written notice prior to the following changes:

#### **7.2.1 Relocation:**

Relocating any production, inspection or processing facilities.

#### **7.2.2 Transferring Work:**

Transferring work between different facilities or locations within a facility.

#### **7.2.3 Changes in Source:**

Initiating any changes in the source of major components procured by the Supplier and designated for use in or for installation on products scheduled for delivery to Spectrum or making any other changes which may affect product quality, reliability or integrity.

#### **7.2.4 Approval of Transfers:**

Any transfers of work are subject to approval/disapproval by Spectrum.

## **8.0 UNAUTHORIZED PRODUCT REPAIRS & SALVAGE**

The Supplier may not perform any repairs on products damaged or found to be discrepant during fabrication or processing, or on defects in castings or forgings, unless such repairs are specifically permitted by the applicable drawing or specification, or specifically authorized by Spectrum. Unless specifically authorized by Spectrum, this prohibition also applies to reworking products by removing plating or anodizing (stripping) and re-plating or re-anodizing.

## **9.0 UNAUTHORIZED PRODUCT CHANGES OR SUBSTITUTIONS**

The Supplier may not make any changes or substitutions to any products or services required by the Contract, drawing, specification, standard, or other applicable document without prior written authorization by Spectrum. Authorization may be contingent on Spectrum conducting an on-site review of the proposed product or service changes at the Supplier's facilities, or the facilities of the Supplier's sub-tier sources.

## **10.0 ALTERING DATA ON DOCUMENTS**

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 such as 1st Article Inspection Reports (FAIR), providing it is clearly obvious that a correction was made by placing a line through the original data, placing the corrected data next to it or as near to it as possible. The correction must be signed, initialed or stamped by an authorized individual. Upon receipt at Spectrum, products or services represented by documents that show evidence that they have been corrected or altered in an unauthorized manner are subject to rejection and return to the Supplier.



## **11.0 CONTRACT/ P.O. CHANGES**

### **11.1 Spectrum Initiated Changes:**

The Supplier shall incorporate all changes at the specified and agreed upon effectivity points initiated by Spectrum and communicated to the Supplier through a formal P.O. or Contract amendment. The Supplier's business management system shall include appropriate controls and records, including controls at the Supplier's sub-tier sources, which provide objective evidence that changes were incorporated. Objective evidence may be in the form of date, lot, serial number, revision letter, or other positive identification. Such records are subject to on-site verification by Spectrum.

### **11.2 Supplier Initiated Changes**

The Supplier may not make any changes in product design, drawings, performance specifications, materials or processes that will result in a Class I change ( defined as changes that affect Fit, Form, Function, Reliability, Maintainability, or Safety) without specific approval by Spectrum in writing prior to making such changes in products or data. When applicable, the Supplier shall flow-down this requirement to the Supplier's sub-tier sources. The Supplier may make changes on products under Supplier's proprietary engineering design control that result in a Class II change (any change other than Class I as defined above). The Supplier shall furnish a copy of the Class II change to Spectrum prior to the initial delivery of the (changed) products, so that Spectrum can verify that the change does not violate the above requirements.

## **12.0 PRODUCT QUALIFICATION**

### **12.1 General:**

This section defines the requirements for production part qualification and approval. The purpose is to determine if all Spectrum design and specification requirements are properly understood by the Supplier and that the manufacturing processes have the capability to consistently meet these requirements. In all instances where a product is manufactured to a new design, for a new system, or for a new application, it is important that the Supplier and Spectrum define responsibilities for assuring that all performance, endurance, maintenance, and safety requirements are met. The Supplier should be able to present objective evidence of their manufacturing capability on similar processes or products, to demonstrate technical competency, when a new process is being used in the production of product for Spectrum.

### **12.2 First Article Inspection (When Specified by "Q" Clause (See Form D-1124) on Purchase Order):**

First Article Inspection (FAI) is required to initially qualify a part/process for Supplier approval, unless the PPAP process (below) is used instead. Furthermore, a new FAI may be requested if there is an extended gap of time since last production. The FAI requires that all features and characteristics on the design specification and control plan be inspected and verified prior to production. Actual measured values shall be recorded as opposed to general statements of conformance or other notations simply indicating acceptance. All FAI's shall be conducted and documented in accordance with AS/EN/SJAC9102 unless otherwise specified in the contract. The Supplier shall furnish a copy of the completed FAIR results with the initial delivery of products on the Contract, and immediately following delta updates. When submitting a First Article Inspection report, the Supplier should use the forms provided in AS/EN/SJAC9102.

### **12.3 Production part (PPAP) Approval Process (When Specified by "Q" Clause (See Form D-1124) on Purchase Order):**

When required by the Spectrum contract/P.O., the Supplier shall submit to Spectrum a comprehensive Production Part Approval Process (PPAP) qualification package. For Spectrum, PPAP shall be in accordance with AS9145. Unless otherwise specified, Level 3 shall apply. PPAP submittals will be forwarded to Spectrum for review and approval. Upon completion of all PPAP requirements, the Supplier shall complete the Part Submission Warrant (PSW). A separate PSW shall be completed for each Spectrum part number unless otherwise specified by the Spectrum contract/P.O. Upon receipt, Spectrum will review and either approve, reject, or provide interim approval. See AIAG PPAP Manual for forms and instructions.

## **13.0 PROCESS CONTROL**

### **13.1 General:**

This section defines the basic requirement for Suppliers to control their manufacturing processes. Suppliers must demonstrate a continuous improvement process that utilizes internal, as well as external data, to provide ongoing improvement in the quality of products delivered to Spectrum.

### **13.2 Special Characteristics:**

The Supplier shall demonstrate conformity to those special characteristics designated by Spectrum through means of documentation and appropriate control methods. In addition to any special characteristics identified by Spectrum, the Supplier shall also review, identify, document, and control other product and process characteristics that are key to achieving quality. It is recommended that the Supplier's variation management program shall be in compliance with requirements of AS/EN/SJAC9103.

### **13.3 Error Proofing:**

The Supplier should use error-proofing devices and techniques as a form of process control; especially for repetitive functions, difficult tasks prone to mistakes, or where high risk processes have been identified. 100% inspection is required for all designated Key or Critical Characteristics.

### **13.4 Work Instructions:**

The Supplier shall prepare documented work instructions in the form of operation sheets, travelers, etc. for all employees having responsibilities for the operation of processes that impact product quality. These instructions shall be maintained current and accessible for use at the work station. Appropriate training is required in order for employees to demonstrate competency prior to working and potentially impacting quality. Training records must be maintained as well as updated on a regular basis for all operators.

### **13.5 Damage Control/ Burr Removal:**

Precautions shall be taken to protect the product from physical damage during all phases of processing. Nicks, dings, or scratches on machined parts that violate the defined surface finish and are visible when viewed using 7X magnification will be cause for rejection of the parts. Machined parts shall also have all internal and external burrs removed and all sharp edges broken as defined on the part drawing.

### **13.6 Control of Monitoring and Measuring Devices:**

The Supplier shall determine the monitoring and measurement to be undertaken and the monitoring and measuring devices needed to provide evidence of conformity of product to requirements. At a minimum, measuring equipment shall be calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards. Where no such standards exist, the basis used for calibration or verification shall be recorded; and be identified to enable the calibration status to be determined. Unless otherwise specified by contract, the Supplier shall establish procedures to control Measuring and Test Equipment (M&TE) that are in compliance with ANSI/NCSL Z540-3, ISO 10012, or ISO/IEC 17025 or acceptable equivalent.

### **13.7 Statistical Process Control (When Specified by "Q" Clause (See Form D-1124) on Purchase Order):**

When specified, the Supplier is required to apply effective statistical process controls. Suppliers should consult the Statistical Process Control (SPC) manual published by AIAG for guidance, methods, examples, and related reference information. Suppliers should maintain records of all data related to Statistical Process Control of special characteristics, and be made available to Spectrum upon request. Supplier shall provide evidence of proper controls for special characteristics when not meeting Cpk requirements.

### **13.8 Preventive Maintenance:**

The Supplier should identify key process equipment and provide resources for machine/equipment maintenance activities; and develop an effective planned total preventive maintenance (TPM) system.

### **13.9 Source Inspection (When Specified by "Q" Clause (See Form D-1124) on Purchase Order):**

When specified, Supplier's products or services may be subject to source inspection by Spectrum, representatives of Spectrum or applicable government or regulatory agencies (e.g. FAA). Source inspection requirements may apply to any and all operations performed by the Supplier or the Supplier's sub-tier sources, prior to delivery of products to Spectrum. Source inspection does not relieve the Supplier of the responsibility to furnish acceptable products or services that conform to all contract requirements. Product rejection can occur at the Supplier's facilities, at any Supplier sub-tier provider, at Spectrum or our customer's facility. For approval of a Waiver or Deviation from any specification requirements in the Contract/P.O., supplier shall submit Form D-1241, Request for Deviation/ Waiver, to the Spectrum Purchasing Agent.

### **13.10 Traceability:**

Suppliers shall establish a lot traceability system that tracks components throughout the value stream, from raw material through shipment to Spectrum. This includes all process steps including inspection and test procedures, rework and sub-tier supplier operations. Where a 'shelf life' restriction applies, suppliers shall ensure that materials are tracked and controlled to prevent expired materials from being used in production.

### **13.11 Shelf-Life Control:**

With each delivery of materials or products that have a limited or specified shelf life, the Supplier shall furnish data that shows the cure or manufacture date as well as the expiration date or shelf life in accordance with ARP5316 (as applicable), along with the lot or batch number. When applicable, any special handling or storage requirements should also be noted. Unless otherwise specified by contract/P.O., the remaining shelf life shall be a minimum of 80% of the total shelf life for the material for all shelf life limited materials or products delivered to Spectrum.

### **13.12 Sampling Inspection:**

The Supplier is responsible for 100% verification of quality for all items delivered to Spectrum. When the Supplier elects to use statistical methods for the acceptance of products or processes, the sample sizes shall be AQL 4.0 or higher (i.e., AQL 1.0, .65, etc.) and the criteria for lot acceptance as zero (i.e., C=0).

### **13.13 Raw Material Lot Control:**

The Supplier shall develop, document, and implement a raw material (sheet, plate, bar, rod, etc.) verification program that will ensure that all material received from the Supplier's sub-tier sources meet all applicable technical and quality requirements. The Supplier's verification program shall include provisions for monitoring and testing all raw materials (every bar, billet, etc.). Upon receipt of any raw material, Supplier shall compare the chemical, physical and mechanical properties data on the mill certification against the material specification requirements and document such comparison. The supplier shall implement appropriate storage and controls to preclude commingling of different heat/lots or batches of material. Traceability shall be provided by identifying the raw material heat, lot, batch or melt number from the certification/test report on the product, product certificate of compliance, or on the packing documentation.

### **13.14 Electro-Static Discharge (ESD) Control:**

Suppliers providing ESD sensitive devices to Spectrum shall, prior to processing product, establish, document and implement an Electrostatic Discharge (ESD) Control Program plan in compliance with the requirements of MIL-STD-1686 or equivalent.

### **13.15 Change Control:**

The Supplier is responsible for controlling changes and notifying the Spectrum Purchasing Agent of all changes to the approved part design, manufacturing process, or site.

#### **13.15.1 Change Control Process:**

The Supplier shall have a process to ensure that relevant versions of applicable documents furnished by Spectrum (as well as those specified of external origin) are available at points of use. The Supplier is responsible for the timely review, distribution and implementation of all Spectrum engineering standards/specifications and changes in accordance with the schedule required by Spectrum. The Supplier shall maintain a record of the date on which each change is implemented in production. Implementation shall include updated supplier documents.

#### **13.15.2 Supplier Change Requests:**

Suppliers shall not make changes to their processes, location, facilities, equipment, material, and product design (or any change which may affect product design or function) without written approval from the Spectrum Purchasing Agent for:

13.15.2.1 Correction of a discrepancy on a previously submitted part;

13.15.2.2 Product modified by an engineering change to design records, specifications, or materials; or

13.15.2.3 Any planned changes by the Supplier to the design, process, or manufacturing location, such as:

a) Use of other material than was used in previously approved part or product

b) Production from new, additional, replacement or modified tools, dies, molds, patterns, etc.

c) Production following upgrade or rearrangement of existing tooling or equipment

d) Production from tooling and equipment transferred to a different plant site or from an additional plant

e) Change of sub-tier Supplier for parts, nonequivalent materials, or services (e.g. heat treating, plating, etc.)

f) Product produced after tooling has been inactive for production for 12 months or more

g) Change to test/inspection method – new technique (no effect on acceptance criteria)

h) For bulk materials: new source of raw material from new or existing Supplier, or change in product appearance attributes, etc.

### **13.16 Obsolescence Management**

Supplier must immediately notify Spectrum if the electronic or mechanical component subassembly, raw material, chemical product or equipment supplied to Spectrum is declared prematurely at end of life due to environmental regulation, market or technology evolution, or any other reason. The Supplier will also notify Spectrum of any items with less than two years of projected manufacture or production.

## **14.0 CONTROL OF NONCONFORMING MATERIAL**

For nonconforming products supplied to Spectrum, including those that reach a Spectrum customer, the Supplier must potentially cover a portion of or all costs to correct the nonconformance including; assessment costs, administrative costs to process the nonconformance, and any rework or repair costs incurred by Spectrum as a direct result from receiving nonconforming hardware from the supplier.

### **14.1 Supplier Request for Nonconformance Deviation:**

A Supplier shall not knowingly ship product that deviates from the drawing, specification limits, or design intent without prior written authorization from the Spectrum Purchasing Agent. In all cases, the Supplier shall fully contain all product suspected of being nonconforming. If such a condition exists, the Supplier may petition the Spectrum Purchasing Agent, in writing, to allow shipment of the product under a written deviation. To request a one-time or temporary deviation for nonconforming product manufactured but not yet forwarded to Spectrum, Suppliers shall use Spectrum's Supplier Waiver/ Deviation Request (Form D-1241), filled out and forwarded to the Purchasing Agent for review by Spectrum. If requested, the Supplier must send samples of such nonconforming items to Spectrum for evaluation. Spectrum approval of a deviation is specific to the product and quantity for which it has been submitted and approved and shall not to be construed as a permanent engineering change. Product shipped to Spectrum that has an approved deviation shall include a copy of the approved Supplier Waiver/ Deviation Request (Form D-1241) with the shipping document package. The Supplier must immediately implement corrective action. Nonconforming product shipped to Spectrum without an approved Supplier Waiver/ Deviation Request form will be documented as nonconforming and a Spectrum Nonconforming Material (NCM) report will be issued against the product, impacting the supplier's Quality Performance Report (QPR) rating.

### **14.2 Control of Reworked Product:**

Rework is defined as additional operations that are not part of the basic production process flow, which will bring product in full compliance with applicable drawings and specifications. Instructions for rework, including re-inspection requirements, shall be accessible to and utilized by the Suppliers appropriate personnel. All rework shall be documented and accepted by the responsible Quality organization. Repair is defined as using alternative manufacturing techniques, methods, materials, or processes which may not bring product into full compliance with applicable drawings and specifications. Repairs are not allowed without written approval from Spectrum.

### **14.3 Notice of Nonconforming Product Escape:**

Should it become apparent that nonconforming product has been provided to Spectrum, a written notice of product escape must be provided to the Spectrum buyer within 48 hours. This notification must include the quantity of potentially or known nonconforming product as well as action(s) taken to contain any additional nonconforming product. The notice must also address corrective action(s) to ensure product provided going forward is conforming.

## **15.0 COUNTERFEIT AND SUSPECTED UNAPPROVED PARTS PREVENTION PROGRAM**

Suppliers shall have policy or procedure to cover and apply requirements, practices and methods to mitigate risk of receiving and installing counterfeit electronic parts (reference SAE AS5553 - Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition). To prevent the inadvertent use of counterfeit parts and materials all fasteners and/or electrical, electronic and electro-mechanical parts delivered and/or used in the manufacture of deliverable products shall be from the Original Component Manufacturer (OCM)/ Original Equipment Manufacturer (OEM) or their franchised dealer or an authorized distributor chain. Parts shall not be used or reclaimed and misrepresented as new. Suppliers shall be in conformance with the requirements of SAE AS6174 assuring acquisition of authentic and conforming material as well as FAA Advisory Circular AC 21-29 for detecting suspect unapproved FAA parts (SUP). Parts shall not be acquired from independent distributors or brokers unless specifically authorized in writing by the Spectrum Purchasing Agent. The supplier shall flow down this requirement to sub-tier suppliers.

## **16.0 FOREIGN OBJECT AND DEBRIS (FOD) PREVENTION**

The supplier shall implement and maintain a system to control contamination of product by Foreign Object and Debris. The supplier's Foreign Object Debris (FOD) Prevention Program is subject to audit, verification and approval and/or disapproval by Spectrum or its designated representative(s).

## **17.0 PRESERVATION, PACKAGING, LABELING, DELIVERY AND CERTIFICATES OF COMPLIANCE**

Cleaning, preservation, packaging, labeling, and shipping methods must comply with common industry practices and Spectrum requirements specified on the contract/P.O.

### **17.1 Cleaning:**

Supplier's processes must ensure cleanliness, require inspection for cleanliness, maintain cleanliness, provide corrosion protection, and control cleaning solutions for Spectrum parts so as to not damage or corrode or have any adverse effects on the parts or coatings. Contaminants such as oil, greases, machine fluid, flux residue, corrosive agents, etc. are to be completely removed prior to packaging. All chips, shavings, and foreign objects must be carefully removed from cavities, blind holes, etc.

### **17.2 Preservation:**

In order to detect deterioration or damage, the condition of product held in stock should be assessed at appropriate planned intervals. The Supplier should use an inventory management system to optimize inventory turns over time and should assure stock rotation, such as "first-in-first-out" (FIFO).

### **17.3 Packaging:**

The Supplier must adequately plan for packaging designed to prevent product contamination, deterioration or loss and to eliminate shipping damage. Suppliers should provide packaging that provides for sufficient density and protection from any likely damage that may occur. Materials and packaging must meet local and national standards for safe disposal and/or recycling.

### **17.4 Labeling:**

Label and bar code requirements may vary among Spectrum orders. The Spectrum Purchasing Agent will provide the Supplier with the necessary specifications.

### **17.5 Delivery:**

The Supplier should systematically inform Spectrum of any anticipated or realized delay in delivering product and provide a new delivery date. The Supplier is responsible for additional expedited transport costs due to delays.

### **17.6 Certificates of Compliance (C of C's) (When Specified by "Q" Clause (See Form D-1124) on Purchase Order):**

A signed C of C by the Supplier's head of quality or company officer (or their authorized delegate) attesting that all products and/or services delivered are in compliance with all contract requirements shall be furnished with each shipment to Spectrum. All C of C's must be in the English language and may be in electronic format with electronic signatures. All signatures or signature blocks must clearly show title of the signatory.

The C of C shall include:

- a) Supplier Name
- b) Part number
- c) Drawing/specification with revision
- d) Spectrum P.O. / Contract Number
- e) Line/release number (when applicable)
- f) Quantity delivered
- g) Cure date and Expiration date (when applicable)
- h) Packing list/shipper number (when applicable)

Authorized Distributors must also supply certification(s) with linkage back to the Original Equipment Manufacturer(s) certification(s). When additional certifications/test reports are required for special processing, raw material, etc. the requirements will be specified on the purchase order.

## 18.0 RECORD RETENTION

The Supplier shall retain quality records for a time period specified by the Spectrum contract or related reference documents. Upon request, the Supplier shall be capable of retrieving and delivering required records to Spectrum within forty-eight hours from time of request by Spectrum. Unless otherwise specified by Spectrum, the Supplier shall safely maintain all records that provide objective evidence of compliance to Spectrum contract requirements for a minimum of fifteen (15) years after the last delivery of products and/or services on the contract. Prior to discarding, transferring to another organization, or destruction of such records, the Supplier shall notify the Spectrum Purchasing Agent in writing and give Spectrum the opportunity to gain possession of the records. These requirements are applicable to records generated by Supplier's sub-tier sources.

## 19.0 CONTINUAL IMPROVEMENT

Suppliers should define a process for continual improvement. A copy of the Supplier's continual improvement program shall be furnished to Spectrum upon Request.

## 20.0 PROBLEM SOLVING PROCESS

Suppliers should use a closed-loop corrective action process whenever a problem is encountered internally or upon notification from Spectrum.

### 20.1 Process Description

1. Describe the Problem- State what the problem "Is," and "Is Not" with respect to what, where, when, who, how, and how many. Use quantitative terms.
2. Use a Team Approach - Consult and coordinate with relevant stakeholders.
3. Apply Containment - Immediately contain any suspect product to protect Spectrum and its customers.
4. Root Cause Analysis - Identify potential causes, analyze causes for failure mode, validate root cause(s), and identify solutions.
5. Implement Permanent Corrective Action - Implement solution. Update applicable documentation and complete training of personnel. Implement changes to prevent the same type of error from occurring in similar products/processes. Update applicable documents.
6. Verify Effectiveness of Corrective Action - Use check sheets, auditing, sampling, and/or control plans to monitor process performance for effectiveness and sustained improvement.

## 21.0 CORRECTIVE ACTION REQUESTS

Spectrum may issue a request for a Corrective Action Request (CAR) to the Supplier when nonconforming material, components, or assemblies are found. When a formal reply is requested the supplier is allowed to use their own form to document the corrective action. When documenting the root cause, the Supplier shall include the underlying reasons:

- a) Why the specific nonconforming condition or incident occurred,
- b) Why it was not detected by the Suppliers quality controls, and
- c) Why the related process, from a systemic viewpoint, allowed the nonconformance (and potentially others like it) to occur.

The Supplier should apply the following criteria to determine whether the underlying root cause has been identified:

1. It initiated and caused the event you are seeking to explain.
2. It is controllable.
3. The elimination of that root cause will result in the elimination or reduction of the problem.

Statements from the Supplier indicating that the corrective action is to alert or retrain the operator, and/or increase inspection, alone, are NOT acceptable corrective actions. These kinds of actions would be considered insufficient and not address the real underlying root cause(s) of why the Supplier's policy, instructions, process, procedure, and/or system allowed the problem to develop and occur and not be detected by quality controls.

## 22.0 SOURCE INSPECTION (When Specified by "Q" Clause (See Form D-1124) on Purchase Order):

Source Inspection, when imposed, requires purchased product verification by a Spectrum Quality Representative at the Supplier's facility prior to delivery to Spectrum. The Spectrum Quality Representative may be a Spectrum employee or a Spectrum authorized third party inspection contractor. The Supplier shall notify Spectrum, or the Spectrum approved inspection contractor, at least forty-eight (48) hours in advance of the time the products will be ready for final inspection. Upon request, the Supplier shall make available to the Spectrum Quality Representative any measuring and test equipment, facilities, records and personnel to facilitate the source inspection.

## **23.0 GOVERNMENT SOURCE INSPECTION (GSI) (When Specified by “Q” Clause (See Form D-1124) on Purchase Order):**

Government Source Inspection (GSI) may be imposed at the discretion the US Government on any Spectrum US Government contract. Upon receipt of this Contract, the Supplier shall promptly notify the US Government representative who normally services the Supplier's plant, in order that the US Government representative can accomplish appropriate planning for conducting source inspection at the Supplier's facilities. If the Supplier cannot locate the US Government representative to arrange for the required source inspection, the Supplier shall notify Spectrum immediately. Upon request, the Supplier shall make available to the US Government representative any measuring and test equipment, facilities, records and personnel to facilitate the Government source inspection.

## **24.0 SUPPLIER PERFORMANCE MEASUREMENTS**

### **24.1 General:**

Spectrum Suppliers are measured for Quality Performance, On-Time Delivery and Response. Suppliers are expected to meet or exceed goals set by Spectrum for these measurements. Corrective measures must be taken if the Supplier does not meet the set goals.

### **24.2 Quality Performance Rating (QPR)**

This measurement is the quantity of conforming parts accepted into our inventory as a percentage of the total quantity of parts received from a supplier in the report quarter.

$QPR \% = \text{Qty Accepted Parts} / (\text{Qty Accepted} + \text{Qty Returned Parts})$

### **24.3 On Time Delivery (OTD)**

This measurement is the count of Purchase Order Lines that are On Time to the Promise Date as a percentage of the total count of Purchase Order Lines that are promised in the report quarter. On Time is defined as 7 days early to 0 days late.

$OTD \% = \text{Count On Time PO Lines to Promise} / (\text{Count On Time} + \text{Count Late PO Lines to Promise})$

### **24.4 Responsiveness Rating**

This rating is a measure of the response of the supplier to Requests for Quotes, Schedule Changes, and Rework or Replacement of Non-conforming material. The supplier response score will be rated by the Spectrum Purchasing Department as follows: **Excellent, Fair, Must Improve.**