

## Supplier Quality Requirements

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## Supplier Quality Requirements

### 1.0 Purpose / Scope / Timing

The purpose of this procedure is to establish supplier quality requirements for Energy Connections (EC) purchased direct materials and services.

#### 1.1 Responsible Roles

- Supplier
  - Provide all parts, documents, and services as outlined in Purchase Order (PO), drawings, and/or specifications

Note: Unless otherwise specified, refers to the corporation, company, partnership, sole proprietorship or individual with whom EC places a Purchase Order (PO).
- Supplier Quality Engineer (SQE)
  - Communicates qualification and production quality requirements to supplier
  - Serves as the key interface with the supplier
  - Communicates qualification acceptance to the supplier
  - Coordinates process improvements, non-conforming material dispositions, corrective actions, and surveillance auditing

Note: The roles and responsibilities of the SQE apply to the Product Quality Engineer (PQE), Quality Process Engineer (QPE) or other business equivalent Global Supply Chain (GSC) representative.
- Sourcing Representative
  - Negotiates price, delivery, terms and conditions
  - Places the PO for qualification and production

Note: The roles and responsibilities of the sourcing representative apply to a site commodity leader (SCL), global commodity leader (GCL), buyer, or other business equivalent sourcing delegate.
- Responsible Engineer
  - Approves nonconformance management, document changes and qualification requirements
  - Communication with the Responsible Engineer must be done with the knowledge of the SQE

Note: For the purposes of this document the Responsible Engineer applies to the Design Engineer, Materials Engineer, Welding Engineer, Repair Engineer, or other Engineering representative.



## Supplier Quality Requirements

### 1.2 Compliance Date

- Full compliance from all organizations within scope is expected at the time of issuance of this document. This document replaces and simplifies the former GE Energy specification P28A-AL-0002 Rev K, Supplier Quality Requirements.
- Any system or specification exceptions to references in this document must be approved by the appropriate EC representative and documented accordingly.



## Supplier Quality Requirements

### 2.0 Procedure / Quality Record Requirements

#### 2.1 Supplier Approval

##### 2.1.1 Minimum Quality System Requirements

- a. Supplier must maintain a documented quality system to ensure control and conformance to the requirements of EC drawings and specifications.
- b. This quality management system must meet current ISO 9001 (Quality Management Systems – Requirements) standards or equivalent applicable standards as determined by EC. Any exceptions to this requirement must be reviewed and approved by the EC SQE during the qualification process.
- c. Compliance to this requirement must be demonstrated if requested through a current certification(s) or successful completion of a quality management systems audit to the current requirements of ISO 9001. EC reserves the right to require this audit to be conducted by a third party service designated by EC. The supplier will be responsible for all costs associated with the audit.
- d. In case of modifications of the above mentioned certification, the supplier shall immediately notify GE SQE responsible. Modifications include, but are not limited to, the following situations:

Any action by either the supplier or the supplier's registrar that limits or alters the condition or duration of the supplier's certification

Renewal, upgrade, suspension, probation, expiration and termination of the mentioned certifications

##### 2.1.2 Supplier Approval

- a. Supplier approval indicates EC has performed a financial, legal, safety, and overall sourcing risk assessment of the supplier and agrees to move forward with the qualification process.
- b. A supplier must be approved per EC Sourcing QMS procedures prior to receiving a PO.
- c. Documents required for approval may include but are not limited to:
  - Properly executed Mutual Non-Disclosure Agreement (MNDA)
  - Acknowledgement of compliance with EC integrity guidelines
  - Completion and passing of required business and technical surveys
  - A documented quality system
  - Technical capability
  - EHS compliance/employment/security practices
  - Financial viability



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- Customer service aptitude
- Strategic value
- Regulatory (e.g. REACH, RoHS, WEEE, etc.)
- Cyber Security

### 2.2 Qualification of Sourced Direct Material

#### 2.2.1 Minimum Quality System Requirements

- a. PO is the governing document, which transmits EC requirements to the supplier. Changes to PO requirements shall not be accepted by the supplier without a formal PO change or an approved Supplier Deviation Request (SDR). In the event of a conflict between documents, order of precedence from highest to lowest is:
  - Purchase Order
  - Part Drawing (unless by note, drawing specifically defers to a specification as the overriding document)
  - Part Acceptance Specification
  - Part Process Specification
  - Material Specification
  - General Requirements Specifications
- b. Any additional business, customer, or product specifications will be communicated to supplier by the EC SQE or designated representative. Unless otherwise indicated, the latest document revision shall apply.

#### 2.2.2 Control of Special Process

- a. A special process is any process where the resulting output cannot be verified by subsequent monitoring and measurement and deficiencies become apparent only after the product is in use or the service has been delivered.
- b. Suppliers must have specific, documented, and controlled procedures for each special process performed.
- c. The supplier shall establish and monitor process CTPs/CTQs.
- d. Only qualified/certified personnel shall be assigned to perform a special process.
- e. The supplier must develop a specific training plan and check the performance of the individual associate on a regular basis.
- f. EC reserves the right to request, review, and approve all special process procedures, training documents, and certification records.



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- g. Processes identified with asterisks (\*\*) are always considered special processes. Others listed should be considered as a special process when specified in product specifications.
1. Babbitting of Bearings
  2. Brazing\*\*
  3. Cleaning
    - a) Chemical – Immersion cleaning processes
    - b) Grit Blasting
    - c) Mechanical
    - d) Thermal Deburr
    - e) Ultrasonic, Alkaline, and Aqueous degreaser
  4. Coating
    - a) Conformal\*\*
    - b) Diffusion\*\*
    - c) High Velocity Oxygen Fuel (HVOF)\*\*
    - d) Painting
    - e) Plasma Spray – Air\*\*
    - f) Plasma Spray – Vacuum\*\*
    - g) Thermal Barrier (TBC)\*\*
    - h) Thermal Spray\*\*
    - i) Vacuum Plasma Spray(VPS)\*\*
  5. Electroplating\*\*
  6. Heat treatment\*\*
    - a. Quench Tempered
    - b. Annealing
    - c. Nitriding
    - d. Stress Relief
  7. Laser Drilling, Cutting, and Marking
  8. Macroetching
  9. Metallography
  10. Non-Destructive Testing/Examination (NDT/NDE)\*\*
    - a) Eddy Current Testing
    - b) Fluorescent Penetrant Inspection (FPI)
    - c) Hydrostatic testing
    - d) Liquid Penetrant (Red Dye)
    - e) Magnetic Particle Inspection (MPI)
    - f) Pulsed Array Ultrasonic
    - g) Thermal Infrared
    - h) Thermoelectric Potential (not per ASNT)
    - i) Ultrasonic
    - j) X-Ray
  11. Pickling (Rust Removal) and Etching



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12. PCBA (Printed Circuit Board) assembly and manufacturing
13. Shot blasting/peening including GASP
14. Soldering
15. Spin Pits – Cold Spin, Hot Spin
16. Welding\*\*
  - a) Flux Cored Arc (FCAW)
  - b) Gas Tungsten Arc (GTAW)
  - c) Shielded Metal Arc (SMAW)
  - d) Plasma Arc (PAW)
  - e) Gas Metal Arc (GMAW)
  - f) Fusion
17. Die Casting
18. Forging and Hot Forming
19. Melting and Raw Material Production
20. Non-Conventional Machining
  - a. STEM Drilling
  - b. ECM (Electro-Chemical Machining)
  - c. ECDM ( Electro Chemical Discharge Machining)
21. Plating and Surface Preparation

### 2.2.3 Process Specific Requirement

- a. Non-Destructive Testing/Examination (NDT/NDE)

Suppliers and sub-tier suppliers performing NDT/NDE as a primary value-added process shall be qualified in accordance with EC-SRC-0003, when applicable.

- b. Welding

Suppliers and sub-tier suppliers performing welding as a primary value-added process can be certified by an approved third party to include but not limited to:

- AWS (American Welding Society) Certified Fabricator
- ASME (American Society of Mechanical Engineers) boiler and pressure Vessel Fabrication Stamp Holder
- CWB Certification
- Major proof of qualification (Class E) in accordance with EN 1090 part 2 “Steel structures, execution and manufacturer qualification”
- PED (Pressure Equipment Directive) Certification
- AISC (American Institute of Steel Construction) Certification



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- Other suitable certifying bodies as determined by industry and regional standards
- c. PCBA
- All contract manufacturers producing PCBAs for EC must meet minimum requirements as outlined in 105X1009. Additional requirements can be defined by each EC site or business in the form of EC Engineering technical specifications or as notes on drawings.
  - Product and process quality standards must meet all requirements specified in 105X1009 for product performance per IPC610 Class 2, unless other specific by site or drawing.





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### 2.2.4 Supplier Qualification

- a. The EC qualification team is established upfront and consists of a cross-function representative of key stakeholders in the qualification process which may include, but is not limited to, the SQE, design engineer, and materials engineer. This team determines qualification requirements, qualification timelines, and has final authority for qualification sign-off as appropriate.
- b. The qualification process demonstrates the supplier's ability to provide high quality parts in accordance with EC drawings, specifications, and other applicable standards.
- c. Qualifications are required for, but are not limited to, the following:
  - A new or existing supplier is manufacturing production material for the first time
  - An existing supplier where a design, process, or volume change impacts the processing, and/or form, fit, or function of the product
  - An existing supplier changes its manufacturing location
  - An existing supplier has quality issues which bring current or previous qualifications into question
  - As required by EC
- d. A product or service must be qualified per EC Sourcing QMS guidelines prior to the supplier shipping products or providing services.

### 2.2.5 Subtier Suppliers

- a. If a supplier outsources a product or process, they are responsible to qualify and continuously monitor all subtier suppliers to EC supplier quality requirements. The same requirements apply to suppliers serving as sales representatives or distributors.
- b. The planned use and manufacturing location of any subtier supplier must be identified in writing to the EC qualification team during the qualification process.
- c. Upon successful qualification of the primary supplier, the subtier supplier identified as part of that qualification must not be changed without prior approval from EC. This requirement shall also be applicable to EC-directed subtier suppliers.
- d. EC reserves the right to:
  - Review supplier's process for approval, qualification, and surveillance of subtier suppliers



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- Approve or disapprove subtier supplier qualifications
- Audit and monitor the subtier supplier's processes and facilities

### 2.2.6 Manufacturing Process Plan (MPP)

- a. When required by the EC qualification team, the supplier must provide a MPP or equivalent documentation. After the item is qualified, the MPP is considered part of the production PO requirements - even if not explicitly referenced on the PO. The MPP is a quality document which requires revision control by the supplier.
- b. Unless otherwise directed by the EC SQE, the MPP must, at a minimum, contain the following information:
  - List of all applicable GE drawings/specifications, ordering sheets, outline drawings, and special process specifications/instructions along with the latest revision letter/number. For build to specification items, the supplier shall provide a list of all supplier drawings and revisions
  - List of Weld Procedure Specifications (WPS) and Process Qualification Records (PQR or WPQR) used in the manufacture of the item
  - Identification of all component parts and sources
  - Identification of all subtier suppliers and their manufacturing locations to include, but not limited to, raw material and any special process suppliers
  - Sequence plan of all major manufacturing and inspection steps with appropriate sign-off documentation. EC reserves the right to view and inspect all supplier proprietary processes and documentation.
  - Manufacturing location
  - Visual weld inspection procedure according to EC-SRC-0004 (when applicable)
  - Revision history

### 2.2.7 Product Quality Plan (PQP)/Inspection Test Plan (ITP)

- a. When required by the EC qualification team, the supplier must provide PQP/ITP or equivalent documentation. The PQP/ITP may be included as part of the MPP or submitted as a separate document. The PQP/ITP is a quality document which requires revision control by the supplier.
- b. Unless otherwise directed by the EC SQE, the PQP must, at a minimum, contain the following information:



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- Clear identification of item, component, or system to which PQP is applicable
- Listing of all technical documents that govern the inspection or test activity (i.e. supplier documents, GE specifications, industry codes/standards)
- Identification of the test or inspection criteria in an itemized listing. Each line item must include:
  - What is to be inspected (to the characteristic level)
  - How it is to be inspected
  - What frequency it is to be inspected
  - When the inspection or test is to be performed (in manufacturing process)
  - Who is to perform the inspection (e.g., Operator, Inspector, etc.)
  - Acceptance criteria
  - Provision for sign off by the party performing the inspection
- Identification of project specific inspections and tests
- Sign-off documentation signifying completion of each inspection and test
- Clear definition of EC and customer involvement in the inspection and test activities (i.e. in-process inspections, customer witness and hold points, document reviews and EC and/or customer release inspections, etc.)
- Identification and verification of CTQs and inspection methods.
- Detailed planning of packaging and preservation for shipment and storage (refer to EC-SRC-0005 as appropriate)

### 2.2.8 First Piece Qualification (FPQ) and Pilot Lot Qualification (PLQ)

- a. When required by the EC qualification team, FPQ must be performed. This requires the supplier to manufacture a first piece of the item using the same process, people, parts, and systems as the planned production environment FPQ documentation must be submitted to EC qualification team for review and approval.
- b. PLQ must be performed if requested by the EC qualification team to verify control of the supplier's processes.



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- c. Upon successful completion of the qualification, a supplier may request release of the material for shipment to EC. Written confirmation of this release must be retained for the supplier's record.
  - If the qualification program has not been completed, this release must be received from the SQE in the form of an approved SDR or other business specific document for accepting material noncompliant with EC specifications and/or procedures prior to shipment.
  - Materials shipped without written authorization from the qualification team will be considered non-conforming material and may be shipped back to the supplier at their expense or incur additional labor back charges to the supplier.

### 2.2.9 Characteristic Accountability and Verification (CAV)

- a. When required by the EC qualification team, CAV forms must be completed and maintained by the supplier.
- b. Product acceptance criteria must be established during the qualification process review of the CAV form. Once the level of inspection and product acceptance requirement has been determined and specified on the CAV form, it must be applied to all production components hereafter to ensure controlled processes for maintaining drawing features and characteristics.
- c. The CAV form must include, at a minimum, the following items:
  - Identification of components
  - Characteristics and feature accountability
  - Inspection and test results
  - Production product acceptance criteria

### 2.2.10 Process Risk Assessment

When required by the EC qualification team, the supplier will perform a risk assessment of its manufacturing and quality assurance processes to evaluate the effectiveness of these processes to consistently produce the component or provide the qualified service. Failure Modes & Effects Analysis (FMEA) is one example of an accepted process risk assessment format.

### 2.2.11 Product Safety Risk Assessment

When required by the EC qualification team the supplier must perform a safety risk assessment for any supplier designed product in accordance with the principles defined by ISO 12100, Safety of machinery - General principles for design - Risk assessment and risk reduction, and provide residual risk information.



GE Energy Connections  
Quality Management System  
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Uncontrolled when Printed  
or  
Transmitted Electronically

GE Proprietary  
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### 2.2.12 Detailed Drawing, Manufacturing, and Producibility Review

- a. When required by the EC qualification team for GE build-to-print items, the supplier will participate in a detailed drawing review with the EC qualification team to ensure suppliers' thorough understanding of drawing requirements and specifications.
- b. When required by the EC qualification team for supplier designed (non-build-to-print items), the supplier will participate in an engineering capabilities assessment and supplier design reviews with the EC qualification team.

### 2.2.13 Packaging and Preservation Requirements

As determined by individual businesses: Equipment arriving at GE Energy Connection / Customer Site is received with an appropriate Certificate of Conformance confirming the equipment is conformed to the Purchase Order.

- b. Preservation and packaging must be in accordance with EC drawings and specifications unless otherwise specified in the PO, approved through the qualification process, or authorized on a SDR. Refer to EC-SRC-0005, General Requirements for Packaging and Preservations, latest revision or specific GE site specific packaging requirements.
- c. each package must be labeled with the following information at a minimum:
  - GE part number with revision number
  - GE supplier code
  - Box quantity
  - Box number
  - Manufacturing date (box pack date)
  - PO number

### 2.2.14 Qualification Documentation

- a. Qualification documents are identified by the EC qualification team per Addendum A or equivalent.
- b. Qualification records are required to be maintained by the supplier and are subject to periodic review by EC. Any deviations from these requirements must be review and approved by the EC qualification team.



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- c. Qualification documentation must be in English unless an exception is specifically authorized by the EC qualification team.
- d. For material shipped directly to an EC customer site, a supplier compliance summary may be issued and maintained as the quality document for each unit shipped. The compliance summary may include but is not limited to the following:
  - Major component nameplate information and serial numbers as applicable
  - Completed MPP and PQP/ITP with appropriate signatures. This should be on file and need not be shipped with the unit
  - Results of all functional test requirements
  - Documented results of all CTQ/CTP measurements and verifications
- e. If shipment is required prior to completion of the qualification, the supplier must receive an approved SDR from GE specifically authorizing the shipment of unqualified material.

### 2.2.15 Qualification Sign-Off

- a. The EC qualification team will notify the supplier once all qualification requirements have been completed successfully. This notification indicates the supplier's manufacturing process used to produce the component(s) or perform the process complied with EC drawing and specification requirements.
- b. Once notification is received, the supplier is released to fulfill subsequent EC POs received for the qualified item.
- c. Qualification approval does not relieve the supplier of the full responsibility, on subsequent orders, to assure the manufacturing processes remain in control and the product or process supplied meets all drawing and specification requirements.
- d. Once the qualification is approved, any change to the approved MPP and established process parameters ("frozen processes") must be communicated to EC SQE for assessment and potential re-qualification as applicable.

### 2.2.16 Supplier Manufacturing Location Change Requirements

- a. All suppliers are required to notify their respective Sourcing representatives and SQEs in the event the supplier or sub-tier supplier's manufacturing location changes from that specified on the approved MPP



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for a given item. Supplier must provide written notification prior to manufacturing product.

- b. EC reserves the right to reject any and all products not meeting the location requirements stated on the qualification form or approved MPP. The supplier will be responsible for shipping and handling charges associated with the unauthorized location change.





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### 2.2.17 Supplier Engineering Change Control

- a. Suppliers must notify EC SQE of their intent to change any supplier-owned design, material, or process.
- b. The supplier is required to:
  - Implement a configuration management system to ensure the control of the engineering definition of the product being developed, manufactured and supported in the field.
  - Submit a Bill of Materials (BOM) as part of the qualification that will represent the product delivered with each subsequent order.
  - Submit a request for design change to EC for approval prior to implementing any changes to the qualified product.
  - Ensure all subtier suppliers maintain configuration control on components and design changes.
  - Maintain the qualified BOM and all subsequent requests for design changes on file for review and audit by EC.
- c. Bill of Material (BOM) Identification

The baseline BOM is defined as the Bill of Material, down to its detailed component level, at the time of the supplier design review during the qualification and prior to entering production. If BOM changes occur after production has begun, the baseline BOM can be used as a snapshot of current production if agreed by EC Engineering.

- d. Supplier Change Control Responsibilities
  - Supplier: The design vendor or supplier will submit copies of the request for design change to the responsible EC representative through the appropriate SDR process. Supplier will not implement changes until approved by EC.
  - EC SQE: The SQE will forward the supplier request for design change to the EC Engineer for disposition. The SQE will add the approved BOM and all subsequent requests for design changes to the qualification records by EC part number.
  - EC Engineer: The responsible EC engineer will request additional data or a detailed review as needed prior to providing final disposition. Disposition will be provided via the SDR process or equivalent.



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e. Record Retention

The supplier will retain records of the approved BOM, requests for design changes, and final EC disposition. These records are subject to review by EC representatives as requested.

### 2.3 Supplier Performance Management

#### 2.3.1 Supplier Performance Evaluation

- a. Suppliers failing to meet established GE performance, quality, or delivery standards are subject to a supplier performance evaluation.
- b. Suppliers are responsible for identifying and driving Performance Improvement Plans (PIPs) based on EC business requirements. These requirements can include, but are not limited to, an established escalation process as dictated by the EC SQE or designated representative.
- c. Suppliers failing to meet EC performance standards must take immediate steps to address concerns or risk termination of the relationship with EC.

#### 2.3.2 Process Capability Checks

When required by EC, suppliers must provide process capability (such as CpK study/data or Gage R&R) for CTQs/CTPs identified on drawings, specifications, or PO. The supplier must regularly analyze CTQ/CTP data for process capability and supply periodic reports to the SQE as requested.

#### 2.3.3 Cost of Failure (COF) and Recovery

- a. COF is the direct cost associated with a supplier's failure to perform to contractual requirements impacting delivery, quality, performance, or other contractual elements. EC SQE will communicate defects and corresponding COF to suppliers based on established EC business practices.
- b. Recovery is the process of assigning responsibility to and recovering cost incurred from a supplier's defective products or services. EC SQE or designated representative will work with suppliers to determine final recovery value and method based on established EC business practices.

#### 2.3.4 Supplier Deviation Requests (SDR)

- a. General supplier requirements with regard to SDRs are:
  - When a deviation to a requirement including a drawing, specification, MPP, packaging, or a material shortage is known or expected to exist, the supplier must submit a SDR to the SQE or designated



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representative using the authorized SDR process. Example deviations include alternate materials, processes, documentation errors or omissions, changes to spare part lists, subcomponents or software even if it does not appear to change fit, form, or function within assemblies.

- SDRs should be submitted for any deviated items at the supplier, in transit from the supplier to EC or its customers, or at an EC facility.
  - A SDR must be submitted and approved prior to shipping deviated parts. EC has the right to request additional inspections and tests beyond applied drawing and specifications to prove deviated part's form, fit and function prior to SDR disposition.
  - The SDR must contain detailed description, containment, probable source and proposed remedial action information as part of the initial submittal. Failure to supply all of the information may result in the SDR being returned to the supplier. If SDR negatively impacts GE fulfillment, the supplier may be charged for all related costs per PO agreement.
  - SDRs are limited exceptions to EC requirements. The approved SDR applies only to PO's listed on the SDR.
  - Unless the SDR involves a drawing change, EC expects the nonconformance(s) to be eliminated on subsequent deliveries.
  - No rework or repair shall be performed on a deviation prior to disposition by EC.
  - SDRs must be submitted by the primary supplier (the seller on the PO), including deviations related to a subtier supplier's scope.
- b. When submitting the SDR, supplier should provide a complete deviation description to include as appropriate:
- Drawing/item number with zone of referenced area
  - Material specification
  - Special processes
  - Inspection results
  - Samples or photographs where applicable
  - Number of defects for the lot(s) of material
  - Specific purchase order numbers by part grouping
  - Serial numbers of the components



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- Estimated time to make correction(s)
  - Cost related issues
  - For serialized parts, the serial number(s) must be identified; for non-serialized parts, the specific purchase order(s) must be identified on the SDR.
- c. Containment is expected to be immediate when nonconformances are discovered. Containment plans are expected to be communicated to EC and implemented within 24 hours depending on the severity of the issue. Deviations from this timeline must be approved by the EC SQE. Containment actions apply to products, process and materials in which the nonconformance was detected as well as similar products or product families in which the nonconformance may occur. Containment will also apply when a formal RCA/CAPA is initiated. Containment at the supplier is expected to:
- Isolate (separate from normal production)
  - Insulate (inspect products to sort for defects at the supplier, in transit for shipment and at the customer site)
  - Aid in control of risk related to the nonconformance
  - Document the supplier's efforts to verify control of its processes.
- d. The supplier is expected to identify all applicable sources of the problem to include:
- Situations involving the same or similar material, product, equipment
  - Instrument or system abnormalities and inconsistencies in the process
  - Environmental conditions (e.g., temperature, humidity, light)
  - Trends associated with equipment performance or specifications
- e. Where applicable, suppliers should provide a rework or repair concept plan for all deviating products and services prior to disposition. Repair or rework recommendations should include:
- Identified risks that would adversely impact the product
  - Planned completion date
  - Estimated time (labor) required to complete correction
  - The supplier shall have a positive identification plan, which ensures deviations and or corrected and or conforming materials are appropriately identified.



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- f. The Supplier must document and show evidence to EC that the remedial actions have been executed. EC will validate that the remedial actions eliminated the deviating condition or met the disposition requirements.
- g. If requested, the supplier must send a copy of the approved SDR along with the part(s) at the time of shipment. Additional markings also may be required.

### 2.3.5 Root Cause Analysis (RCA)/Corrective Action and Preventive Action (CAPA)

- a. When requested, the supplier performs a formal RCA/CAPA to include containment, corrective, and preventive actions. Supplier is responsible for related expenses as per EC contract.
- b. Root cause analysis report and corrective actions must be implemented, documented, and communicated (as CAR, 8d, or other approved method) to EC as directed by SQE (Refer to section c below) after supplier is notified of the issue by EC. Supplier is responsible for related expenses as allowed per EC contract for supporting production in parallel to these activities.
- c. RCA/CAPA plans should address the following with the specified time periods after being notified of the quality issue by EC.
  - Correction and containment actions with full traceability provided within 24 hours
  - Root causes identified within 5 working days
  - Corrective and preventive action plan with action item owners and target dates for implementation provided within 10 working days
  - Corrective actions implemented within 30 working days
  - Preventive action implementation will be verified during supplier surveillance audits.
- d. Deviations from the timelines established above must be approved by the EC SQE.
- e. RCA/CAPA requests that remain open longer than the specified time periods outlined above without SQE authorization may result in disqualification of the part or process.
- f. As requested, corrective action plans need to be approved by EC prior to execution.



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- g. The supplier must provide and maintain objective evidence that the actions have been accomplished.
- h. As requested, all supplier related processes, training, specification and drawing changes shall be documented and made available to EC prior to closure.
- i. As requested, validation of the corrective action plan will be performed prior to closure.

### 2.4 Supplier Responsibility Guidelines (SRG)

#### 2.4.1 Supplier Responsibility Guidelines (SRG) assessment

- a. EC is required to do business only with suppliers that comply with local laws and EC expectations in the areas of employment, human rights, environment, health, safety and security. Assessment criteria include, but are not limited to:
  - Human Rights (i.e. freedom of movement, non-discrimination, dispute resolution)
  - Labor Practices (i.e. child labor, forced labor, wage records, overtime tracking)
  - Working and Living Conditions (i.e. workplace, cafeteria, and dorm inspections)
  - Environmental (i.e. waste storage/disposal, air emissions, wastewater treatment)
  - Health and Safety (i.e. fire suppression and personal protective equipment, exits)
  - Compliance Status (i.e. permits, fatalities and serious injuries records)
  - Potential Off-site Impacts (i.e. soil and groundwater contamination)
  - Security (i.e. premises protection, container safeguards, government certifications)
- b. EC will provide impacted suppliers with SRG assessment checklist and any other SRG-related documentation to include, but not limited to, GE Integrity Guide for Suppliers.
- c. Suppliers are responsible for ensuring that they and their employees, workers, representatives, and subcontractors comply with the standards of conduct required of EC suppliers.
- d. EC is required to ensure all new suppliers are screened for SRG requirements as part of the supplier approval process and to ensure any



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findings that result from the assessment are resolved prior to goods shipping from or services provided by suppliers.

- e. EC is required to ensure all existing suppliers are screened for SRG risk on an annual basis. The determined risk level and manufacturing site location will dictate the frequency of on-site SRG audits at supplier facilities.
- f. Suppliers failing to meet SRG requirements must take immediate steps to comply or risk termination of the relationship with EC.

### 2.5 Further Requirement

#### 2.5.1 Specification Transmittal to Suppliers

- a. It is incumbent upon the supplier to review with the Sourcing Representative and/or SQE the appropriate document retrieval methods that may be specific to their business. It is also the responsibility of the supplier to review specification revisions with the Sourcing Representative and/or SQE on a continuous basis to ensure that the correct revisions are being worked to. When suppliers receive a PO, it is the supplier's responsibility to verify they have the latest revision of the specification called out on the drawings and purchase order.
- b. Unless otherwise notified by EC, suppliers are required to implement the most recent specification revisions on all existing and future POs except where parts have already entered the manufacturing process. Any exceptions to this policy must be negotiated between the GE sourcing representative and supplier.

#### 2.5.2 Source Inspection and Test Witness Requirements

- a. EC and its customers may elect to inspect parts or witness the assembly process at the supplier's facility. All source inspection and test witness requirements will be identified and coordinated through the SQE or other designated representative.
- b. It is the supplier's responsibility to notify EC in advance when material will be ready for inspection. This advance notification must allow time for EC and its customers to make plans to be available on site, minimum 15 working days before.
- c. EC and customer acceptance of product does not relieve the supplier of its obligations to supply components that meet drawing and PO requirements.

#### 2.5.3 EC Owned Tooling



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- a. EC owned tooling must be identified in a permanent manner which is nondestructive to the tool. Identification shall include both a unique tool identification number and notification that the tool is EC owned.
- b. Tooling must be stored in an appropriate environment to ensure protection from weather, plant traffic, corrosive elements, and other situations that would be destructive to the fit, form, or function of the tooling.
- c. As required for all product specific (EC funded) tooling, suppliers will establish and implement a preventive maintenance program to include: cleaning, inspection, repair, and small refurbishment. Major repairs and tool replacement are to be handled on a case-by-case basis by EC sourcing representative.

### 2.5.4 AQAP 2110 Requirements

In order to meet the requirements of AQAP 2110, all requirements of a contract may be subject to GQA. You will be notified of any GQA activity to be performed.

## 2.6 Quality Records (if applicable)

### 2.6.1 Documentation

Quality and product records , as directed by business requirement, include, but are not limited to:

- Product quality or inspection and test plans and results
- Material specifications
- Qualification documentation
- Certificates of conformance (i.e: Attached to packaging)
- Other specific component record requirements specified in POs or contracts

### 2.6.2 Record Retention

- a. The supplier shall have a written procedure for the documentation and retention of quality and product records for products supplied to EC.
- b. Records shall be maintained for a minimum of Five (5) years unless otherwise specified by EC.





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- c. It is the responsibility of the supplier to determine the appropriate storage means to meet the retention requirement and allow for timely retrieval of records.

### 3.0 Definitions, Acronyms and References

#### 3.1 Definitions

- Containment: Actions taken to minimize the risk to GE Energy Connections or its customers associated with a nonconformance. Containment actions can be focused on the product in which the nonconformance was detected as well as focused on similar products or product families in which the nonconformance may occur.
- Correction: Action to eliminate a detected nonconformance, defect or other undesirable situation.
- Corrective Action: Action taken to eliminate the cause(s) of an existing nonconformance, defect or other undesirable situation to prevent recurrence.
- CpK study/data: report process capability and process performance through statistical measurements
- Critical to Quality (CTQ) Characteristics: Internal critical to quality parameters that relate to the wants and needs of the customer. Also called critical to process (CTP) characteristics.
- Gage R&R: Gage repeatability and reproducibility, is a statistical tool that measures the amount of variation in the measurement system arising from the measurement device and the people taking the measurement.
- Frozen Process: A manufacturing method, process, procedure or control that was approved by the EC Qualification Team.
- Manufacturing Process Plan (MPP): A detailed, step-by-step list of operations and requirements by which components or services are manufactured.
- Non-Destructive Testing (NDT): Analysis techniques used to evaluate properties of material, component or system without causing damage. Typical methods would include ultrasonic, magnetic-particle, liquid penetrant, radiography, eddy-current testing, etc.
- Preventive Action: Action taken to eliminate the cause(s) of a potential nonconformance or undesirable potential situation to prevent occurrence.
- Product Quality Plan (PQP): A detailed, step-by-step list of operations and requirements in which a supplier identifies a process of how, what, why, when



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and who will perform tests or inspections and the applicable acceptance criteria. This may also be referred to as an Inspection and Test Plan (ITP).

- Purchaser: EC business, or its business associate.
- Qualification Requirements: All required documentation for qualification as determined by EC qualification team.
- Repair: A type of correction performed to a nonconformance that reduces but not completely eliminates the nonconformance(s) such that the product is determined to be usable for its intended purpose.
- Request for Design Change: A document submitted by the supplier to request EC engineering approval prior to implementing a change in design.
- Rework: A type of correction performed to a nonconformance that completely eliminates the nonconformance(s) such that the product conforms to the specification or requirement.
- Scrap: A disposition for nonconforming product that is not useable for its intended purpose and that cannot be economically reworked or repaired in an acceptable manner.
- Special Process: A process by which results cannot be fully verified through subsequent nondestructive inspection and testing of the product and where processing deficiencies may become apparent only after the product is in use. Additionally, processes that require operators of that process to be qualified and certified to be able to conduct the process and meet technical regulations and standards are considered special processes.
- Supplier Deviation Request (SDR): A request initiated by the supplier to deviate from purchase order technical requirements (drawings, specifications, engineering instructions, etc.) or the approved qualification package.

### 3.2 Supporting Documents

The specifications identified in the preceding paragraphs may not be applicable to all EC businesses. Confirmation with the SQE is required for applicability. The documents are available in <http://www.geenergyconnections.com/supplier-quality>. These include but are not limited to:

- EC-SRC-0003 Nondestructive Testing Process Qualification and Approval (replaces P28A-AL-0203)
- EC-SRC-0004 Visual Inspection Requirements for Weldments (replaces P29B-AL-0001)
- EC-SRC-0005 General Requirements – Marking, Preservation, Packaging and Shipping (replaces P23E-AL-0255)



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- EC-SRC-0008 - Counterfeit Parts Avoidance Requirements for Independent distributors and high risk suppliers
- EC-SRC-0009 - Contract Manufacturer Counterfeit Part Avoidance Requirements
- 105X1009 Electronic Supplier Quality Requirements



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### 4.0 Document Revisions and Approvals

The following chart lists the revisions made to this document tracked by version. Use this to describe the changes and additions each time this document is re-published. The description should include as many details of the changes as possible.

Records of Reviewers and Approvers may be found within the DMS (Document Management System).

Version	Section Modified and Revision Description	Date	Author
1.0	New Issue. Replaces P28A-AL-0002 Rev K	11/8/2013	Tiffany Shomo
2.0	Added section 2.2.2 a. defining special process	11/11/2013	Tiffany Shomo
2.1	Corrected error in table of content	01/09/2014	Arianto Lawardi
2.2	Add Section 2.2.2 special process – 6,a, b, c, d; 17, 18, 19, 20, 21	06/22/2015	Arianto Lawardi
2.3	Add section 2.1.2. C – Cyber Security	09/02/2015	Arianto Lawardi
3.0	Replace Energy Management as Energy Connection	07/08/2016	Arianto Lawardi
3.1	Clarified and updated section: 2.2.4, 2.2.6, 2.2.8, 2.2.13, 2.3.2, 2.3.5b, 2.6.1, 3.1, 3.2	11/17/2017	Stephane Prost-Dame, Mike Obrien, Mike Csernik, Balvinder Seetal, Juan Ibanez, Arianto Lawardi
3.2	Add section 2.5.4 AQAP 2110, add additional references on Section 3.2	11/13/2019	Arianto Lawardi, Neil Holdsworth, Jonathan Southam

Title: Supplier Quality Requirements  
 Reference: EC-SRC-0002  
 Revision: 3.2  
 Application Date: 11/13/2019  
 Expiration Date: 11/13/2022



## Supplier Quality Requirements

### 5.0 Addendum A

#### Qualification Documentation

This addendum defines the requirements for preparing and submitting qualification documents (when applicable).

Section #	Quality Document	Quality Document Description
1	Bill of Materials (BOM)	List to include item #, description, model, etc.
2	Calibration	Provide copy of all calibration procedures and certification for all devices that were used and calibrated on this
3	Characteristic Accountability & Verification Forms (CAV)	Provide a copy of the CAV report
4	Component Conformance	Include a certificate of conformance (COC) for all major components: e.g., pump curves, testing certifications, calibration certificates, and relevant data sheets
N/A	Cover Sheet	None
5	CpK study/data	Provide a copy of CpK study/data, which measures how close a process is running to its specification limits, relative to the natural variability of the process
6	Design Calculations/ Code Compliance	Provide a copy of all design calculations for applicable components/systems (Pipe stresses, pipe supports, pressure vessels, lifting lugs) per Domestic and International codes and documents to validate this commodity meets all Domestic and International Code Compliances for the following but not limited to: CSA,CRN,IEC,CE,PED,ATEX,NEC
7	Flush and Cleanliness	Checklist of procedures related flush and cleanliness
8	Functional Tests	Provide a copy of all Mechanical, Electrical, and Functional Tests performed. This should include testing procedures, documented data of all testing performed and signoffs that equipment passed testing
9	Gage R&R	Provide a copy of the result of statistical tool that measures the amount of variation in the measurement system arising from the measurement device and the people taking the measurement.



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10	Mechanical Testing and Heat Treating	Provide copy of all Hardness testing, Heat Treatment, stress Relieving, Metallography, and Grain Etch procedures and results
11	Nondestructive Testing	Provide copy of all Nondestructive Testing procedures. Provide copy of NDT Personnel list qualified to perform NDT on this project. Suppliers written NDE practice Per. ASNT SNT – TC – 1A
12	Photographs	Photos of GE products or deviations
13	Preservation and Packaging	Appropriate preservation and packaging is required for each part
14	Special Process Procedures	Extended performed procedures for manufacturing processes
15	Special Tests	Extended routine tests that need to be performed
16	Supplier Deviation Request	Deviation request from supplier
17	Supplier Drawings	Provide copy of all supplier generated drawings, including revision level
18	Supplier Inspection Report	Supplier Report of Inspection
19	Supplier Manufacturing Process Plan	Provide a copy of the supplier MPP, signed and dated by the Supplier Manufacturing Representative and/or sub-tier suppliers used
20	Supplier Product Quality Plan	Provide a copy of the supplier PQP signed and dated by the Supplier Quality Representative
21	Surface Preparation and Painting	Include all Metal Preparation, Prep for paint, paint procedures along with QA Paint data, signoffs, and paint specifications
N/A	Table of Contents	None
22	Technical and Regulatory Standards	Provide a listing of all applicable TRS documentation showing product meets requirements for the country of end use.

