



Document Code	ARSB-O&G-001
Title	Supplier Quality Requirements
Applicability	GE Oil & Gas
Process Owner	Oil & Gas Global Supplier Quality Leader
Issue Date	15.10.2010
Revision	1.0
Cause of Revision	As described in paragraph 2
Carried out by	Salvatore Grillo
Checked by	Glen Parkes, Niel Mathienson, Mauro Mannelli, Carlo Rossi, Piero Morganti, Thomas Glenn
Approved by Champion	George Kunder



**TABLE OF CONTENTS**

- 1. Introduction ..... 3
- 2. Historical Trace ..... 3
- 3. Scope ..... 4
- 4. Responsibility ..... 4
- 5. Applicable Documents..... 4
  - 5.1.1 GE Oil & Gas Documents..... 4
  - 5.1.2 International Standards ..... 4
  - 5.1.3 Hierarchy of Documents..... 4
- 6. Communication ..... 5
- 7. Definitions..... 5
  - 7.1 Entities..... 5
  - 7.2 Other Terminology ..... 5
  - 7.3 Other Acronyms..... 7
- 8. General Quality Requirements for all Suppliers..... 8
  - 8.1 Quality System..... 8
    - 8.1.1 Sub-Suppliers/Sub-contractors ..... 8
  - 8.2 Supplier Approval ..... 8
  - 8.3 Quality Records ..... 8
  - 8.4 Inspection and Auditing ..... 9
- 9. Specific Requirements for Direct Material Suppliers ..... 9
  - 9.1 Special Processes..... 9
    - 9.1.1 Welding..... 9
    - 9.1.2 NDE ..... 10
  - 9.2 Independent Validation / Certification ..... 10
  - 9.3 Material Certification ..... 10
    - 9.3.1 Certified Laboratories..... 10
  - 9.4 Material Traceability ..... 11
  - 9.5 Quality Records of Direct Materials..... 11
  - 9.6 Supplier Qualification ..... 11
    - 9.6.1 Sub-tier Suppliers..... 12
    - 9.6.2 Qualification Documentation..... 12
  - 9.7 Supplier Disqualification ..... 13
  - 9.8 Document Management..... 13
  - 9.9 Source Inspection and Test Witness Requirements ..... 13
  - 9.10 Non Conformity Management ..... 14



9.11 Non Conformities detected after release to GE Oil & Gas or Customers..... 15  
 9.11.1 Cost of Poor Quality..... 16  
 9.12 Supplier Manufacturing Location Change or Sub-Supplier Change Requirements.. 16  
 9.13 Process Capability / Special Quality Requirements..... 16

ADDENDUM A - Tech. Specification For Vendor Supplied Documentation-Qualification Book (Electronic)  
 ADDENDUM B – Special Processes List  
 ADDENDUM C – Additional Quality Requirements for Drilling and Production suppliers.

**1. Introduction**

GE Oil & Gas is committed to driving quality excellence and customer satisfaction with products and services manufactured by GE Oil & Gas or produced through Suppliers and sub-Suppliers.

The purpose of this specification is to establish a set of procedures and practices pertaining to the quality of items purchased by GE Oil & Gas. The requirements set forth herein will ensure a consistent, quality-based relationship between GE Oil & Gas and its direct material suppliers.

**2. Historical Trace**

Rev. N.	Revision Date	Effective Date	Revision Description
1.0	15/08/2010	01/10/2010	Added quality requirements of indirect material suppliers Eliminated Qualification requirements not describing Suppliers' responsibilities, eliminated Item type classification Eliminated use of SDR to approve shipment prior to FPQ closure Added Laboratories certification requirements Added supplier disqualification paragraph Added paragraph on Back Charge due to repetition of inspection Added paragraph on Cost of poor quality Merged with Drilling and Production general quality requirements Revision number aligned to Documentum Archive
0	04/02/2008	04/02/2008	ARSB-O&G-001 issued by GE O&G adapt P28A-AL-0002 to GE Oil & Gas requirements
G	-	Prior to 04/02/2010	P28A-AL-0002 (GEE) was adopted

References

P28A-AL-0002: <http://www.gepower.com/about/suppliers/en/document.htm>

ARSB-O&G-001: [http://www.gepower.com/businesses/ge\\_oilandgas/en/about/supplier\\_portal.htm](http://www.gepower.com/businesses/ge_oilandgas/en/about/supplier_portal.htm)



### 3. Scope

This specification provides the minimum quality requirements for GE Oil & Gas external suppliers. This specification is part of GE Oil & Gas purchase order and it is fully applicable to suppliers of direct materials used in GE Oil & Gas delivered goods and services.

All paragraphs with exception of paragraph 9 are also applicable to suppliers of indirect materials and services.

Drilling and Production specific requirements are marked as "D&P" in this specification.

### 4. Responsibility

Responsibility for updating this procedure lies with the Oil & Gas Global Supplier Quality Leader or a person delegated by the Oil & Gas Global Supplier Quality Leader.

This specification is a controlled document in the GE Oil & Gas Sourcing Quality Management System.

### 5. Applicable Documents

The following documents form part of this specification to the extent specified herein.

Alternate applicable business-specific technical requirements will be communicated to Supplier as required (examples, ASME, API, ITN, etc...). Unless otherwise indicated, the latest document revision shall apply. Scope limitations are highlighted in brackets).

#### 5.1.1 **GE Oil & Gas Documents**

ARSB-O&G-002 Preservation and Packaging (not for Drilling and Productions)

ARSB-O&G-003 Shelf life materials (not for Drilling and Productions)

MP100 Global Sourcing Quality Requirements (D&P only)

VGS2.20 Special Quality Requirements (D&P Only)

#### 5.1.2 **International Standards**

ISO 9001 Latest revision - Quality Management Systems Requirements

#### 5.1.3 **Hierarchy of Documents**

The Purchase Order is the governing document that transmits GE O&G requirements to the Supplier. In the event of any conflict, inconsistency or ambiguity between the Purchase Order requirements and this document, statutory requirements or industry standards referenced in the document or any other document, it is the responsibility of the supplier to submit a Supplier Deviation Request. In case of no Supplier Deviation requested, GE Oil & Gas will apply



the most conservative requirement. It is the responsibility of the supplier to be fully aware of all the statutory & industry standards related to the purchased component.

## 6. **Communication**

The GE O&G purchase order designates the Sourcing Representative who is the primary contact with the supplier for commercial issues. The SQE is the primary quality and technical contact and will be assigned by Sourcing Quality management as appropriate. Changes to purchase order requirements shall not be accepted without a formal purchase order change, a change in the purchasing specification and/or applicable documents approved by GE Oil & Gas, an approved supplier deviation request or through cleared non-conforming material reports.

Various process or procedure forms (e.g. SDR forms, frozen process change request forms, etc.) referenced in this specification may be obtained from the appropriate GE O&G Sourcing representative.

## 7. **Definitions**

### 7.1 **Entities**

- Supplier - Unless noted otherwise, refers to the corporation, company, partnership, sole proprietorship or individual with whom GE O&G places a Purchase Order.
- Purchaser - The GE O&G business or its business associate.
- Sourcing Quality Engineer (SQE) - GE O&G representative who defines the qualification and production quality requirements, and is the key interface with the supplier relative to qualifications, process improvements, nonconforming material dispositions, corrective actions, and surveillance auditing.
- Sourcing Representative - GE O&G representative who negotiates price, delivery, terms and conditions, and places the purchase order for qualification and production. The Sourcing Representative is also the official contact between the supplier and GE O&G.

### 7.2 **Other Terminology**

- Characteristic Accountability and Verification (CAV) - CAV form may be required in the qualification program; if so, CAV must be completed and maintained by the supplier. The CAV form must include, at a minimum, the following items: Identification of components, Characteristics and feature accountability, Inspection and test results, Manufacturing Planning, Production Product Acceptance Criteria. A CAV form or equivalent form is required at time of shipment of the part. This is only required on the first piece unless specifically required by the SQE on subsequent orders or as indicated on the purchase order.
- Detailed Drawing, Manufacturing and Producibility Review - Prior to part manufacturing, the supplier may be required to participate in a detailed drawing review with the GE O&G Qualification



Team to ensure suppliers' thorough understanding of drawing requirements and specifications during the qualification process. For Supplier Designed, non Build to Print (Functional Spec/Sourcing Controlled) type A, B1 and B2 items, the supplier may be required to participate in an Engineering Capabilities Assessment and Supplier Design Reviews with the GE O&G Qualification Team.

- Direct Material – Material purchased for use on a Customer job and identified in the Bill of Material.
- Field Service Notice (FSN or NCM)- A Field Service Notice documents non-conformances identified by GE O&G field engineers and authorizes the field to perform warrantable equipment repairs.
- First Article Inspection (FAI) - The supplier shall accomplish a FAI process for the first item or batch in a series to provide objective evidence that all design and specification requirements are properly understood and that prescribed production method have produced an acceptable item as specified. Such process will be described in a specific FAIR document for a specified item
- First Piece Qualification (FPQ) – Type of qualification process that requires the supplier to manufacture a first piece of the item as outlined in the applicable GE O&G specifications and/or as defined by the appropriate Sourcing Quality and Engineering personnel. First Piece Qualification documentation must be submitted to GE O&G for review and approval. Upon successful completion of the FPQ, a supplier may request release of the material for shipment to GE O&G. Confirmation of this release must be documented and placed with the item to be shipped, as well as retained for the supplier's record. Materials shipped without written authorization from the SQE 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.
- Frozen Process - A manufacturing method, process, procedure or control that was approved by the GE O&G Qualification Team and documented in the MPP.
- Indirect Material - Material purchased for use in the shop floor, in the plant or in the office not part of the Bill of Material (e.g. consumables, tools and equipment, etc)
- Manufacturing Process Plan (MPP) - A detailed, step-by-step list of operations and requirements by which component(s), or service(s) are manufactured. An MPP must, at a minimum contain the following information: A list of applicable GE O&G specifications, ordering sheets, outline drawings, and special process specifications/instructions along with the latest revision letter or number; List of Weld Procedure Specifications (WPS) and Procedure Qualification Records (PQR) used in the manufacture of the part; Identification of component parts and sources; Identification of critical sub-tier suppliers. Critical sub-tiers include but are not limited to Raw Material and any special process supplier; A sequence plan of major and critical manufacturing and inspection steps with appropriate sign-off documentation. Supplier proprietary processes may be handled with the SQE directly; the manufacturing location; When applicable, a visual weld inspection procedure according to GE O&G docs. Once the MPP is approved, the MPP shall be considered part of the purchase order requirements even if not explicitly referenced on the purchase order.
- Non-conformance Notice (NCN or Non-conformance Report NCR or GRR) – A GE O&G nonconformance report initiated during processing through a GE O&G factory or location. This also maybe referred to as Quality Control Report (QCR) or different names depending on the specific GE O&G business.
- Pilot Lot Qualification (PLQ) - A pilot production lot may be required as determined from GE O&G specifications or processes. In addition, the qualification team may require a pilot lot or additional pilot lot testing to verify control of the supplier's processes upon final qualification.



- Process Risk Assessment – When required by the qualification team, the supplier must 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. The appropriate cross-functional supplier personnel must perform this risk assessment with the assistance and participation by the GE O&G Qualification team members as necessary. One format for this assessment is a Failure Modes & Effects Analysis (FMEA).
- 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 and who will perform tests or inspections and the applicable acceptance criteria. This may also be referred to as a Quality Control Plan (QCP) or ITP (Inspection and Test Plan) or other equivalent names depending on the specific GE O&G business. The PQP must, at a minimum, contain the following information: clear identification of the item, component, or system to which the PQP is applicable; Listing of technical documents that govern the inspection or test activity (i.e. supplier documents, GE O&G specifications, industry codes/standards); Identification of the test or inspection criteria in an itemized listing. Each line item must identify 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 the sense of the manufacturing process), who is to perform the inspection (e.g., Operator, Inspector, etc.), and the acceptance criteria. Each item must include provision for sign off by the party performing the inspection; Identification of Project specific inspections and tests; Completion of each inspection and test will be accompanied by appropriate sign-off documentation. Each inspection and test must be signed-off during the execution of the PQP; Clear definition of GE O&G and customer involvement in the inspection and test activities. This includes but is not limited to in-process inspections, customer witness and hold points, document reviews and GE O&G and/or customer release inspections; Identification and verification of CTQs and inspection methods. CTQs can be identified by purchase orders, specifications, drawings, or by the appropriate SQE; Detailed planning of packaging and preservation for shipment and storage; The PQP or QCP may be included as part of the MPP or submitted as a separate document. The PQP must be approved by the SQE.
- Qualification Package - Required documentation for qualification (for maximum case see Addendum A).
- S-400 – GE additional process to certify ISO 17025 laboratories for selected items.
- Services- Activity purchased by GE Oil & Gas as part of a contractual obligation to Customers or for internal needs.
- 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.
- Supplier Deviation Request (SDR or GRV) -A request initiated by the supplier to deviate from purchase order technical requirements (drawings, specifications, engineering instructions, etc.) This may also be referred to under different names depending on the specific GE O&G business.

### **7.3 Other Acronyms**

- CTQ - Critical To Quality
- D&P – Drilling and Production
- FAIR – First Article Inspection Requirements



- ITP – Inspection and Test Plan
- NDE – Non-Destructive Evaluation
- NDT- Non-Destructive Testing
- PO – Purchase Order
- QMS – Quality Management System
- SQR – Special Quality Requirement
- VGS – Vetco Gray Standard
- SDRL – Supplier Document Register List

## **8. General Quality Requirements for all Suppliers**

### **8.1 Quality System**

It is the responsibility of the supplier to define and implement a detailed quality system that ensures products supplied to GE O&G conform to GE O&G drawings and/or applicable specifications, and meeting the requirements set forth in this document. Any applicable industry and regulatory standards (such as ANSI, AGMA, API, etc.) must also be included into the system. GE O&G requires that this quality management system meet the requirements of ISO 9001 (latest edition) and it must be made available to GE O&G for review upon request. GE Oil & Gas reserves the right to require a) an ISO9001 compliance audit to be conducted at Supplier's expenses by a third party service designated by GE or b) ISO9001 certification within a specified timeframe (usually one year from approval).

#### **8.1.1 Sub-Suppliers/Sub-contractors**

Suppliers are responsible for communication and implementation of the GE Oil & Gas quality requirements to the subcontractors or sub-suppliers whose products, services or materials affect the quality of service or product provided to GE Oil & Gas or GE Oil & Gas customers. Suppliers shall establish and control quality requirements of their sub suppliers.

### **8.2 Supplier Approval**

In order to receive a GE O&G production purchase order, a supplier must be approved per GE O&G Global Sourcing Quality Management System procedures.

### **8.3 Quality Records**

Quality records of GE Oil & Gas purchase order of products and services must be retained for a period of minimum ten (10) years unless otherwise specified by GE O&G. Quality



records must be available upon request. Additional requirements for direct material purchases are detailed in paragraph 9.5.

#### **8.4 Inspection and Auditing**

GE, GE nominated inspectorate or GE clients reserve the right of access to inspect, audit, expedite or witness at your premises and at any of your subcontractors locations. GE shall provide reasonable notice to the Supplier prior to the commencement of any agreed audits. GE and/or its nominated inspector, may perform inspection surveillance at both Supplier and sub-supplier locations in accordance with the approved PQP/ ITP, however it reserves the right to amend the inspection activity and frequency of visits as it deems necessary.

### **9. Specific Requirements for Direct Material Suppliers**

Suppliers of direct materials must comply with the requirements of section this paragraph and its sections. Suppliers of Drilling and Production must also comply with requirements in Addendum C.

#### **9.1 Special Processes**

Suppliers must have specific, documented and controlled procedures for each special process performed. Suppliers are responsible to identify the special processes performed. Special processes include, but are not limited to what listed in addendum B.

Supplier shall ensure that processes which require pre-qualified procedures and/or work methods are tested and qualified before work begins; e.g. NDT, special fabrication techniques, lining and painting, etc. Such procedures shall be submitted to the GE O&G for review and approval where specified in the PO before the work begins. It's the supplier responsibility to ensure operators are qualified for the process in accordance with the procedures and / or applicable standards.

Suppliers must also maintain documentation for any special processes performed by their 3rd party suppliers.

##### **9.1.1 Welding**

Suppliers, including sub-tier suppliers, performing welding as a primary value added process, shall be qualified in accordance with procedures and technical specifications proper applicable in GE O&G (including ANSI B31.3, ASME section IX or AWS). Submittal of procedures



for review and approval may be required on purchase order. Welders and procedures must be qualified in accordance with ASME Section IX or similar governing agency specified on purchase order from GE O&G business.

### **9.1.2 NDE**

Suppliers, including sub-tier suppliers, performing NDE shall be qualified in accordance with procedures and technical specifications proper applicable in GE O&G. Submittal of procedures for review and approval may be required. This certification may be performed by a third party, as required by GE O&G.

## **9.2 Independent Validation / Certification**

When required by equipment specification and data sheets, the Supplier shall engage a recognized independent Certification Authority (i.e. Lloyds, DNV, etc) to certify equipment design and compliance to specified codes such as pressure vessels, heat exchangers, lifting equipment, etc. Material certification should have independent verification indicating the scope of verification, including witnessed, reviewed, it shall be signed, dated, position of the representative, shall have official stamps.

## **9.3 Material Certification**

The agreed levels of material certification for supplied items/parts shall be detailed within the approved MPP or within the ITP submitted for review after PO award or specified in the Purchase Order requirements. The Supplier shall ensure that these requirements are included in associated sub-orders and clarified with Suppliers. Material test reports, certificates of compliance, type test certificates etc. as applicable for materials and items/parts of equipment within packages shall be made available for review (original or verified copies) at the package Supplier's or sub-Supplier's works. Documents shall quote GE Oil & Gas PO and item/part numbers.

### **9.3.1 Certified Laboratories**

GE O&G requires that certificates of conformity to GE quality requirement must be issued by laboratories that meet the requirements of ISO 17025 (latest edition); compliance to ISO 17025 must be made available to GE O&G for review upon request.

In addition, compliance to quality requirements for forgings, pipes, tubing, fasteners greater than 1" diameter and bar stocks must be issued by Laboratories which meet the requirements of S-400. List of GE certified laboratories as per S-400 is available on request.



## **9.4 Material Traceability**

Traceability is to ensure proper identification of finished products down to raw materials. Suppliers shall demonstrate effective material control procedures that, where specified, can trace materials from point of origin through stages of the manufacturing process through to acceptance by GE. The Supplier material control system and traceability procedures shall be made available, upon request, for review.

## **9.5 Quality Records of Direct Materials**

The supplier shall have a written procedure for the documentation and retention of quality and product records for products supplied to GE O&G as applicable and determined by the SOE during qualification. The record retention period shall be a minimum of ten (10) years unless otherwise specified by GE O&G. Records shall include, but are not limited to, product quality or inspection and test plans and results, material specifications, qualification documentation and certificates of conformance. Specific component record requirements may be specified in GE O&G purchase orders, contracts or specification. 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.

## **9.6 Supplier Qualification**

Once approved the supplier may only supply parts that they have been formally qualified to produce by GE. No parts can be supplied out of the scope of the qualification. A qualification program is defined and documented by a GE O&G qualification team. The supplier is required to perform the qualification using the documented qualification program plan as communicated by the SOE.

Suppliers shall request a new qualification process in any of the following cases:

- (1) Supplier wants to extend the scope of supply to new materials, products or items
- (2) A design or process change has occurred at the supplier/sub-supplier or at GE O&G, significantly changing the processing, form or function of the product
- (3) Supplier (or critical sub-tier supplier included in the MPP) wants to change its manufacturing location. Please refer also to paragraph 8.14.
- (4) Supplier wants to introduce a new critical sub-supplier
- (5) Any other deviation from the MPP



GE Oil & Gas can reject this request of qualification extension or change.

### 9.6.1 Sub-tier Suppliers

If a supplier chooses to outsource a special process, the supplier is fully responsible for qualifying sub-tier suppliers to meet GE O&G requirements and notifying GE O&G of this qualification. No outsourcing can be performed to any sub-supplier beyond the list of approved sub tier suppliers.

GE O&G reserves the right to review the supplier's process for selection, qualification, and surveillance of sub-tier suppliers, to approve, or disapprove, sub-tier supplier qualifications, audit and monitor the sub-tier supplier's processes and facilities when deemed necessary. This requirement also applies if the supplier is a sales representative or distributor that procures from sub-tier suppliers for manufactured parts or assemblies.

The planned use and manufacturing location of any sub-tier supplier must be clearly identified in the MPP during the qualification process. Upon successful completion and qualification of the primary supplier, the sub-tier supplier identified as part of that qualification must not be changed without prior approval from GE O&G. This requirement shall also be applicable to GE O&G directed sub-tier suppliers.

### 9.6.2 Qualification Documentation

Qualification records, MPPs, material certifications, PQP, ITP and related documentation records are subject to periodic review by GE O&G. GE O&G also reserves the right to request submittal of these records at any time.

An Electronic Qualification Book must be submitted in accordance with requirements as outlined in Addendum A. Any deviations from these requirements must be accepted at the discretion of the SQE.

Upon successful completion of the qualification program and receipt of the Supplier Qualification Approval Form, the supplier is released to fulfill subsequent purchase orders received from GE O&G. This qualification form indicates that, at the time of qualification and based on data provided by the supplier, the manufacturing process used to produce the component(s) or perform a process was capable of complying with GE O&G drawing and specification requirements.

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 drawing and specification requirements, unless formal, written approval for a deviation is obtained from GE O&G via an SDR/GRV or equivalent process.



## **9.7 Supplier Disqualification**

Failure to meet the GE Oil & Gas quality standards, or the ISO9001 QMS standards, or breaches in the MPP/PQP/ITP will cause the disqualification of Suppliers. Suppliers cannot receive new purchase order until their qualification status is back to “qualified”. GE Oil & Gas can decide not to restart the qualification process.

Supplier shall initiate a new qualification process to change their status back to qualified.

## **9.8 Document Management**

When suppliers receive a new purchase order, it is the supplier’s responsibility to verify they have the latest revision of the specification called out on the drawings and purchase order. It is also the responsibility of the supplier to review specification revisions with the Sourcing Representative and/or SOE in preparation of the intermediate or final inspections or prior to release for shipment.

## **9.9 Source Inspection and Test Witness Requirements**

The supplier is responsible for the PQP/ITP to be applied to the purchase order. PQP/ITP must be pre-approved in the MPP or approved by GE Oil & Gas before the commencement of work.

GE O&G and/or its customer may elect to inspect parts, and/or witness subassemblies at the supplier’s facility during processing, testing, or at final inspection. Source inspection and test witness requirements are to be identified and coordinated through the GE O&G SOE, Quality Assurance, quality representative or other designated representative.

It will be the responsibility of the supplier to notify GE O&G in advance, when material will be ready for inspection according to PO requirements. In case a witnessed inspection needs to be repeated by GE Oil & Gas due to Supplier’s responsibility, GE Oil & Gas will back charge the costs of the inspection to the Supplier.

GE O&G and/or customer acceptance of product does not relieve the supplier of its obligations to supply components that meet drawing and purchase order requirements.



Inspection by GE Oil & Gas personnel or representative does not relieve the supplier of its responsibility to execute and document the internal tests and inspections as per PQP/ITP. GE Oil & Gas has the right to review and approve this documentation upon request.

## **9.10 Non Conformity Management**

For supplier detected Quality issues, the Supplier shall operate a system to detect and control non-conformances at stages of the purchase order. The Supplier shall immediately notify GE Oil & Gas in writing of any non-conformances to specified requirements or conditions that may have an impact on the final product or service.

For eSDR-enabled suppliers, this is through the eSDR system. For SIMON enabled suppliers this is through the GRV system. For non-eSDR/non-SIMON enabled suppliers, this is via electronic medium such as email to the GE Buyer. Non-conformance notifications shall include details of the non-conformance, immediate containment action immediately, other product lines that have been shipped that may be affected, proposed corrective and preventative action, estimated time to perform the corrective action, schedule and cost implications.

The non-conformance report shall be communicated via the GE nominated system where applicable. Corrective action shall not be taken prior to GE Oil & Gas approval being granted.

A supplier deviation request (SDR/GRV) must also be submitted by the supplier for approval of alternate materials, processes, drawing errors, drawing changes, and other deviations to the PO requirements. The request must include a complete description of the deviation, drawing number, zone of referenced area, material specification, the quality affected, and special processes involved in the repair (if applicable). Additionally, the specific material covered by the SDR/GRV must be identified on the SDR/GRV. For serialized parts, the serial number(s) must be identified; for non-serialized parts, the specific purchase order(s) must be identified.

Non-conforming material or other requests may not be accepted or repaired without prior GE O&G approval. The supplier shall not presume approval of the request until a dispositioned copy is made available to the supplier. The supplier may act on the disposition only at that time, including shipping hardware that has been accepted in the SDR/GRV disposition



If requested by the SQE, the supplier must send a copy of the approved disposition along with the part(s) at the time of shipment. Additional markings, or "Green tags" may also be required at the discretion of the SQE.

SDRs/GRV's are "one-time" exceptions to GE O&G requirements. Unless the SDR/GRV involves a drawing change, GE O&G, expects the non-conformance(s) to be eliminated on subsequent deliveries.

SDRs/GRV's should be submitted by the primary supplier (the Seller on the Purchase Order). Any deviations (e.g. drawing changes, material substitutions, etc.) related to a sub-tier supplier's scope should be submitted through the primary supplier. If a sub-tier supplier has a GE O&G -issued supplier code, then, with concurrence from the responsible SQE, the sub-tier supplier may be permitted to submit the SDR directly to GE O&G.

All costs associated to the supplier deviation requests (including but not limited to engineering extra hours or supplier deviation management with the Customers) due to suppliers' mistake can be back-charged to Suppliers.

## **9.11 Non Conformities detected after release to GE Oil & Gas or Customers**

For quality issues detected by GE Oil & Gas, GE representative or the Customer, a Non conformance report/Global rejected Report will be communicated to the supplier. At notification of the non-conformity, the Supplier shall immediately:

- Clarify the issue with the SQE
- Describe containment actions to be put in place within 24 hours from notification of the non-conformity. This is required to ensure that no more defects escape the suppliers location and shall include:
  - List of suspect products and communicate the list to GE
  - Location of the parts
  - Plan to purge suspect parts, to be submitted within 72 hours.
- When required by GE Oil & Gas, execute an RCA to be carried out with corrective actions and permanent preventative actions to be communicated to GE within 7 days. RCA shall include:
  - Identified root cause(s) of the non-conformance
  - Corrective and preventive action Plans (action, owner, due date).
  - Analysis of the internal supplier control(s) which failed
  - Actions to improve the failed control(s)
  - Planned date for next internal audit to verify actions have been effective



Actions remaining open longer than the specified period may result in disqualification of the supplier.

Upon request, all suppliers and sub-suppliers must immediately provide all necessary support and data associated with nonconformance issues or quality investigations.

### **9.11.1 Cost of Poor Quality**

GE Oil & Gas will incur to costs due to the defects due to suppliers' mistake. Costs associated with defects, including but not limited to inspection costs, storage and transportation costs, rework costs, engineering redesign costs, non conformity management costs will be recovered by GE Oil & Gas. Refusal from supplier to settle the back-charged amounts will result in any or all of the following: settlement of due amounts against any other credit due to the supplier even not related to the material purchased, disqualification of supplier, legal action in court.

### **9.12 Supplier Manufacturing Location Change or Sub-Supplier Change Requirements**

Suppliers are required to notify their respective Sourcing representatives and SQEs in the event the supplier's manufacturing location changes from that specified on the approved MPP for a given item. Notification must take place prior to manufacturing product and must be in writing. GE O&G reserves the right to reject any and products not meeting the location requirements stated on the qualification form and/or approved MPP. The supplier will be responsible for shipping and handling charges that will be applied to any products rejected for this criterion. This requirement also applies to sub-tier supplier relocations or changes of sub-tier suppliers. Failure to notify a supplier's manufacturing location change or a sub-supplier change may result in disqualification of the supplier.

### **9.13 Process Capability / Special Quality Requirements (SQR)**

The supplier must measure and record data for CTQ / CTP identified on the drawings and specifications and by the SQE. The SQE may require the supplier to analyze the CTQ data for process capability and supply periodic reports to the SQE. Under the direction of the SQE, the supplier may be requested to execute improvement projects based on the process capability analysis. The suppliers can also independently and regularly analyze the CTQ data for process capability as part of their Quality Management System. Where an SQR is identified on the drawing, the additional requirements on the drawing are also applicable. For Drilling and Production, SQR are identified in the Engineering Part Specifications, which are also attached with the PO as described in VGS 2.20.



ADDENDUM A  
Electronic-Qualification Book

This addendum defines the requirements for preparing and submitting an Electronic-Qualification book for inclusion into GE O&G e-SQM, or Sourcing Quality Electronic Library.

1.0 Qualification Documentation Requirements As the final requirement of the Qualification Process, the Supplier must submit one Electronic- Qualification book to GE O&G for Qualifications

2.0 Qualification Book Requirements The Electronic- Qualification Book requires the following items, preferably in this order

Section #	Quality Form Name	Quality Form Description
N/A	Cover Sheet	None
N/A	Table Of Contents	None
1	GE O&G Purchase Order	Provide Copy of GE O&G Purchase Order for this Project
2	GE Specifications/GE O&G Drawings	Provide a list of all GE O&G Specifications, and GE O&G Drawings , including Revision level.
3	Supplier Drawings	Provide copy of all Supplier generated drawings, including Revision level.
4	Supplier Product Quality Plan (PQP)	Provide a copy of the Supplier Product Quality Plan (PQP), signed and dated by the Supplier Quality Representative
5	Supplier Manufacturing Process Plan (MPP)	Provide a copy of the Supplier Manufacturing Process Plan (MPP), signed and dated by the Manufacturing Representative and/or the Sub-Tier Suppliers used
6	Characteristic Accountability and Verification Forms (CAV)	Provide a copy of the CAV report for this project.
7	GE O&G Qualification Program, GE O&G Product Quality Plan	Provide a copy of the GE O&G Qualification Program, and or GE O&G Product Quality Plan for this Project
8	Bill of Materials (BOM)	List to include Item #, description, model, etc...



9	Component Conformance	Include C of C for all major components: e.g., pump curves, testing certifications, calibration certificates, and relevant data sheets
10	Design Calculations	Provide a copy of all design calculations for applicable Components/Systems (Pipe Stresses, Pipe Supports, Pressure Vessels, Lifting Lugs) per Domestic and International Codes
11	Code Compliance	Provide a copy of all 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
12	Material Test Reports	Provide copies of Material Test Reports for all material used on this Project to include, but not limited to the following: Piping, Structural Steel, Bolting materials (Bolts, nuts, washers), Tubing, Raw Materials, Welding Consumables
13	Welding Procedures	Provide a copy of the Welding/ Brazing Procedure, Specification, and all welder qualification records used on the Project.
14	Nondestructive Testing	Provide copy of all Nondestructive Testing procedures. Provide copy of NDT Personnel list qualified to perform NDT on this project. It includes but not limited to Suppliers written NDE Practice Per. ASNT SNT-TC-1A
15	Castings and Forgings	Provide all procedures, data and charts for the following processes: casting, machining, forging, bar stock
16	Mechanical Testing and Heat Treating	Provide copy of all Hardness testing, Heat Treatment, Stress Relieving, Metallography, and Grain Etch procedures and results
17	Surface Preparation and Painting	Include all Metal Preparation, Prep for paint, paint procedures along with QA Paint data, signoffs, and paint specifications
18	Calibration	Provide copy of all calibration procedures and certificates for all devices that were utilized
19	Functional Testing	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.
20	Proof Test, Type Test	Provide Procedures and results for all Proof Tests, and Type tests performed on this Project ASNI Referenced. Include the methods to be used in all type and proof testing, either by ANSI, ASME, IEEE, IEC, NEMA or other standard procedures, or by written description



21	Flushing and Cleanliness	Provide a copy of the Flushing procedure and cleanliness procedure used to verify cleanliness per GE O&G business specification
22	Preservation and Packaging	Provide a copy of procedures and data to verify compliance in accordance with GE O&G specifications.
23	Repair/Rework	Provide any Rework procedures and results
24	Supplier- Inspection Reports	Provide a copy of all Inspection reports, travelers, and other quality documents used in the Suppliers Facility
25	Critical to Quality (CTQ) Data	Provide any Critical to Quality (CTQ) Data defined by the SQE for this project
26	Supplier Deviation Record List	Provide a copy or List all SDRs used on this Project
27	Photographs of the Equipment	Provide photos of the completed Commodity
28	Packing List	Provide a copy of the Packing List
29	GE O&G - Certificate of Conformance	Provide a copy of the C of C that is submitted to The GE Routing Center
30	SQE Final Inspection Report	Provide a copy the SQE's Final Inspection Report in this section

There may be cases where a hardcopy of the Qualification Book is also required. This requirement will be at the SQE's request.

3.0 Applicable Sections and Documents

The Supplier and the SQE shall discuss prior to submission of the Electronic-Qualification Book which Sections and Documents are applicable to the Commodity

4.0 Electronic- Qualification Book Format

Documentation is to be supplied in an Electronic Format, (PDF) is preferred. The Qualification Book shall be supplied on a CD labeled accordingly and sent to the SQE.

5.0 Qualification Book (Hardcopy)

There may be cases where a hardcopy of the Qualification Book is also required. This requirement will be at the SQE's request.



ADDENDUM B  
Special Processes List

Special processes are included but are not limited to the list below.

1. Brazing
2. Cleaning - Chemical and Mechanical
3. Coating and Spray Coating
4. Die Casting
5. Eddy Current Testing
6. Forging and Hot Forming
7. Heat Treatment
  - Annealing
  - Nitriding
  - Stress Relief
8. High alloy cold forming
9. Hydrostatic testing
10. Investment casting
11. Liquid penetrant evaluation
12. Magnetic particle evaluation
13. Melting and raw Material Production
14. Nitriding/Carburizing/boriding
15. Non-Conventional Machining
  - STEM Drilling
  - ECM (Electro-Chemical Machining)
  - ECDM (Electro Chemical Discharge Machining)
16. Other forms of NDE
  - Fluorescent Penetrant
  - \*Thermal / Infrared
  - Thermoelectric Potential
17. Plating
18. Plating and surface preparation
19. Radiographic evaluation
20. Sand Casting
21. Screw machining All Shot Peen, including GASP
22. Stamping
23. Superalloys machining
24. Grinding on Superalloys (Shrouds, Nozzles, Buckets)
25. Ultrasonic evaluation
26. Tool and Die Making
27. Welding
28. Babbitting of Bearings
29. Blade Extrusion Process
30. Electro-Discharge Machining (EDM)
31. Flame Hardening – Buckets
32. Laser Drilling, Cutting, Marking, cladding, welding
33. Macroetching
34. Metallography
35. Painting
36. Pickling (Rust removal) and Etching
37. Spin Pits - Cold Spin, \*Hot Spin
38. Tenon Peening
39. Vacuum Plasma Spray (VPS)
40. \*Waterjet Strip



### ADDENDUM C

## Additional Quality Requirements for Drilling and Production suppliers

### **A. Special Processes**

Weld qualifications, Welder Qualification Certificates, NDT procedures, and NDT Operators Certificates are to be approved by GE Oil & Gas Drilling and Production prior to commencement of work. Prior to any Welding of Free Issue material, the supplier must ensure that a copy of the Material Certification is available to ensure the parameters of the Weld Procedure does not exceed the original tempering temperature of the material. Missing certification should be requested from the relevant GE Oil & Gas Drilling and Production representative. Incoming documents of fabrications shall include a weld map that has been signed off by GE Oil & Gas Drilling and Production, irrespective of documentation being retained by the manufacturer / supplier. NDE requirements are as dictated by VGS and any additional requirements that may be called up on the purchase order or relevant drawings.

### **B. Certifications**

The agreed levels of material certification for supplied items/parts shall be detailed within the ITP submitted for review after PO award. The Supplier shall ensure that these requirements are included in all associated sub-orders and clarified with Suppliers. Material test reports, certificates of compliance, type test certificates etc. as applicable for materials and items/parts of equipment within packages shall be made available for review (original or verified copies) at the package Supplier's or sub-Supplier's works. All documents shall quote GE Oil & Gas Drilling and Production PO and item/part numbers.

### **C. Marking**

All forgings / material should be identified with hard stamp (labeled for small parts) and stenciled with minimum 1" high letters. Required identification includes the following, where applicable:

- i. GE Log Number
- ii. GE Purchase Order, Line Item and Unit Number, Part Number and Revision Status (at time of manufacture)
- iii. Manufacturing Order
- iv. Any GRR or GRV pertaining to the part

Where agreed, the supplier may use his own Serial Numbering System to identify the part. The documentation which accompanies the goods must cross reference the GE Purchase Order Number. Lacking other instructions, the following apply:

- i. Turnkey Supply - The GE Oil & Gas Drilling and Production Purchase Order will be used as the Serial Number of the Part. E.g. Purchase Order Number/Line Item/Item Number (P136200-0001-1).



ii. Free Issue Material - GE Oil & Gas Drilling and Production will allocate a Works Order Number, e.g. M123456/001 indicated on the Purchase Order. This number will be the Serial Number of the equipment.

Low Stress stamps will be used on finished Machined Parts, where practical, unless otherwise instructed by Purchase Order, drawing or Bill of Material.

Fabricated Assemblies will have all stamped areas masked prior to final paint. This area will be finished at GE Oil & Gas Drilling and Production prior to shipment to Customer. Hard Stamps will be used for stamping of Fabricated Parts e.g. Tree Frames etc., with the exception of Riser Fabrication Components e.g. Connectors, Tubular and any Structural Component subjected to cyclic loadings, which require identification by Low Stress Stamps. (Where the BOM is unclear, clarification must be requested by the supplier).

### **D. Packing and Preservation**

The Supplier shall not commence any packing or shipping of any components before final inspection and mechanical completion release documentation has been reviewed and accepted by GE Oil & Gas Drilling and Production. The preparation for transportation or export shipping may be subject to inspection by GE at Supplier's or Sub-Supplier premises prior to shipment. Inspection shall not relieve Supplier from any responsibilities or obligations under the PO Agreement. It is the Supplier's responsibility to ensure that all materials and equipment are properly and carefully packed for sea, road, rail or air transportation as appropriate.

Material delivered to GE Oil & Gas Drilling and Production must be shipped in a safe manner as to make it easy to unload by forklift truck, i.e. pallets or skids. Stamping details should be clearly visible without the need for GE personnel to manhandle the material.

Note: If it is unsafe to position the material on the pallet to show identification, additional indelible markings will be required to show a minimum of PO Number and Part Number, on an area clearly visible to GE Goods Receipt personnel.

Goods arriving without relevant paperwork or marked incorrectly may not be unloaded and returned to the source at the Supplier's cost.

Goods must be protected with a coating of suitable rust preventative (Esso Rustsolve Light, Shell Ensis Fluid or an alternative approved by GE Oil & Gas Drilling and Production)



In compliance with GE Oil & Gas Drilling and Production Health Safety & Environmental objectives, any load and / or material delivered loaded in an unsafe manner shall be rejected without being unloaded. All associated risks and liabilities rest with the Supplier.

Any part or box that can be lifted manually must be weighed by the Supplier. If found to be more than 25kg, the part or box must be identified with the total weight. This measure is to highlight any risk to GE receiving personnel.

Where Suppliers pack multiple parts into one box, the combined weight must be clearly identified.

Load/Lifting Certification must accompany goods. Equipment received without the appropriate certificates will be rejected and regarded as non-conforming product and an Inspection Rejection Report raised. Slings must be loaded in such a manner as to make it easy to unload by forklift truck, i.e. pallets or skids.

## **E. Documentation**

For a full list of document requirements by commodity, see Appendix 1, Supplier Document Requirements List.

All documentation submitted shall be produced / written in the English language.

All electronic files and documents shall be submitted in native file electronic format and, where agreed, documents may be scanned and submitted in electronic PDF format.

Where required by a specific project, the supplier may have to submit documents for approval prior to production commencement. Such documents may include but are not limited to Test Procedures, Inspection Procedures and NDE procedures.

## **F. Certificate of Conformity**

One copy of a certificate of conformity must accompany goods at time of delivery. The certificate and the goods must be identified with the GE Oil & Gas Drilling and Production Part Number and Order Number as a minimum. The receipt of the certificate will form part of our invoice approval procedure.

The certificate of conformity shall contain as a minimum the following information:



- Suppliers name and address
- The consignee name and address
- Reference traceable to the delivery note
- Detail of the product being delivered
  - Part number
  - Part description
  - Revision
  - Quantity
- Material traceability information/reference to (as applicable)
  - Lot
  - Batch
  - Serial numbers
  - Mould number and batch number for elastomeric type products (moulded parts)
- A statement of conformity to the purchase order and or any drawings or specifications quoted. National specifications shall be quoted in the statement. Including any Tests carried out referencing accompanying results

-  
Any "Concession, Permit or Repair Scheme" agreed by GE Oil & Gas Drilling and Production must be referenced on the C of C quoting Concession, Permit or Repair Scheme reference number.

All testing carried out must be referenced on the C of C quoting the approved test document/standard.

When the supplied part is CE marked; the C of C must reference the applicable EU Directives or Legislation and cross reference the accompanying EU Declaration of Conformity.

The certificate of conformity shall contain the authorization by the company appointed designee

- Name (printed)
- Signature
- Position within the company



- Date

Note: if the supplier is contracted to retain all other paperwork it shall be stated on the certificate of conformity

- What certification is being retained
- Supplier reference

### G. Databooks

All documentation must be compiled in Data Book format in a chronological manner and accompany the Finished Part. The contents shall be, but not limited to:

- 3.1 Material Certification (Turnkey Supply)
- 3.2 Material Certification (See definition)
- Dimensional reports
- NDE reports
- Cladding Thickness Report
- Weld Maps / Log Sheets
- Weld Procedures
- Welders Qualifications
- Heat Treatment Charts
- Hardness Reports
- Threading Certificates
- Coating Certificates
- Pressure Test Certificates
- Drift Certificates
- Certificate of Conformity
- Material Substitutions
- Concessions / GRVs Raised
- PMI report certifying material to VGS

Note: Material Certification, NDT, Hardness, Coating, Clad Thickness Reports must state the VGS or Standard used for the part / material supplied.

### H. Mechanical Properties

For purposes of determining conformance with VGS material specifications, all specified ultimate tensile strength and yield strength limits are absolute limits, as defined in ASTM Practice E 29, Using Significant Digits in Test Data to Determine Conformance with Specifications.



Unless GE Oil & Gas Drilling and Production has accepted an alternative procedure, hardness verification and process control will be in compliance with VGS 8.7.1 (Latest Revision). Where hardness verification is a requirement of a proprietary part, the VGS is not applicable.

## I. Dimensional Reports

Where material is shown as "oversize to guarantee finished dimensions," GE Oil & Gas Drilling and Production will only accept up to a maximum of ¼" per side on dimensions given. Where BOM's do not state a tolerance, the supplier must contact GE for clarification at the quotation stage.

- **Machined Parts** - Machined parts with dimensions as follows must have actual results recorded on the report:
  - Diameter and Lengths with a tolerance of + / - 0.005" or less.
  - Angles with a tolerance of + / - ½ Degree or less.
  - Surface finishes with 32 Microns or less (where accessible)

All other dimensions will be recorded as being verified by applying a tick to the report.

Where Thread Gauges are used, the Serial Number must be recorded on the Dimensional Report. (If a gauge number has been specified on the VG Drawing, every effort must be made by the supplier to obtain the specific gauge from GE Oil & Gas Drilling and Production).

- **Fabricated Assemblies** - Dimensional Reports stating actual dimensions shall be required for all machined areas with a tolerance of + / - .010" or less, all other dimensions will be verified as acceptable to requirements and documented on suitable format.
- **Proprietary Parts** - No Dimensional Report is required to be supplied with proprietary parts, the recording of dimensions will be in accordance with Suppliers own Quality System. GE Oil & Gas Drilling and Production reserves the right to request any proprietary and fabrication dimensional information that will assist in establishing root cause of any subsequent test failures of GE Oil & Gas Drilling and Production equipment.

Where Quality Plans have been agreed upon, documenting the level of certification required to be sent with the goods, the above will not apply.



## J. Product Specific Requirements

- **Pipe**

Pipe purchased in accordance with API 5L may be drifted in accordance with Vetco Gray Procedure A022510. However this requirement will depend on specific contract requirements therefore, will be highlighted on the Purchase Order if required.

Super Duplex and Duplex piping must be carefully handled and protected during all phases of manufacture, assembly and storage - please refer to PIMS document HTS-940143, and or ASTM A380, sections 1.3 & 1.4

- **Studs**

Studs and stud bolts must be marked in accordance with ASTM specification and should be fully traceable.

For hot dipped galvanized studs only, the thread on tap end after galvanizing must meet the gauging practice for the type of thread stated to class 2A requirements.

- **Fasteners**

Fasteners must be marked in strict accordance with ASTM A194, including Grade and Manufacturers mark.

Material Certificates must refer to Cast or Heat Code.

Certification must conform to the requirements of ASTM A194, suppliers to retain copies of original certificates for a minimum of 15 years

Suppliers shall provide a delivery note or certificate of conformance with each delivery summarizing inspections performed.

Where required by ASTM A194, proof load testing will be performed in strict accordance with ASTM A194

Where agreed by GE Oil & Gas Drilling and Production, certification may be retained by the supplier (unless specified on the Purchase Order), providing that it can be made available to Vetco Gray on request. If additional cost is incurred from a sub supplier, the retrieval costs shall be formally agreed between the two parties.



• **Elastomers**

Elastomers to be supplied in black polythene bags suitably labeled with the following information:

- Vetco Gray Part Number
- Quantity
- Vetco Gray Purchase Order and Item Number
- Type of Material
- Compound Number
- Batch Number
- Cure Date
- Storage Life
- Durometer Hardness

• **Proprietary Valves**

For proprietary valves classed as 'major pressure containing', that form a primary barrier integrated within VG equipment, a Design Verification Certificate and Product Conformity Testing Certificate from a designated independent regulatory certifying authority of the supplier's choice, shall be included in the documentation supplied. A copy of the pressure test charts and reports shall also be supplied.

**K. SDRL Documents**

The documents will be requested via PO or SDRL Check Sheet.

	Raw	Machining	Fabrication	Coating
Certificate of Conformity	x			
Material Test Reports / Certs	x			
Load Test Certificate			x	
Lifting Certificate			x	
<b>Trace Sheets</b>				
Trace - Raw Material, Assy, Weld Map, Weld Filler	x	y	y	
<b>NDE Reports</b>				
Radiographic Report (X-Ray/PAUT)	y		y	y
Ultrasonic Test Reports (UT)	y		y	y
Magnetic Particle Test Reports (MT)	y		y	y
Liquid Penetrant Test Reports (PT, LP)	y		y	y
<b>Heat Treat Reports</b>				
Heat Treat Charts	x			y
PWHT/Stress		y	y	y



<b>Performance Tests</b>	Raw	Machined	Fabrication	Coating
Factory Acceptance Test (FAT)				
Pressure Test			x	
Drift Report	z	z	z	
<b>Product Inspections</b>				
Dimensional Log/Report	x	x	x	
Hardness	x			
Coating Report				y
Paint Report				y
Final Checklist		x	x	
Incoming Inspection Report	x	x	x	
Assembly Inspection Report			x	
Clad Thickness Report				y
Welding Inspections			x	
Visual Report				
Torque Report/Charts			x	
Positive Material Identification Report	x	x	x	
Surface Test Report	x	x		y
<b>Raw Material</b>				
Volumetric NDE	x		y	y
Hardness	x		y	y
Mech/Performance Testing	x			y
<b>Misc</b>				
Concessions	y	y	y	y
GRR's	y	y	y	y
Inspection & Test Plan	z	z	z	z
Manufacturing Process Plan	z	z	z	z
TPI Sign-offs *	z	z	z	z
TPI/Customer release note				
Completed Databooks				
Photos of Equipment (Nailsea)				
Purchase Order Receipts				
Stock Tickets				
Mini-Packs / Work Packs				
Tally Sheet				
Pick List				
Warehouse Receiving List				

Document Required	x
Document Required if Operation Performed	y
Stated in PO if Required	z