

Turbomachinery & Process Solutions

<ARSB-O&G-006 | Rev. 1.0>

<Supplier Quality Requirements - Addendum for AS/EN 9100 requirements>

<03 Jan 2018>

Andrea Fregiati

TPS Sourcing Quality Leader

Giovanni Manelli

TPS MFG Quality Leader

Talamona Plant

Document Revision Chart

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.

#.#	Section Modified and Revision Description	Date	Author
1.0	First issue	03/01/2018	Manelli G. Fossati M.
--	Document rebranded (BHGE > Baker Hughes); updated obsolete references (ARSB-O&G-001 > BH-SOU-001)	08/04/2020	Carolina Biondi

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1.0 Purpose

The purpose of this specification, in addition to what has already been established by BH-SOU-001, is to integrate a number of activities and practices to meet the requirements of the international standard AS/EN 9100 at the latest valid edition.

2.0 Applicability

This specification is applicable to Baker Hughes suppliers of direct materials and services to meet the requirements of the international standard AS/EN 9100 at latest valid revision.

Where applicable, it will be expressly mentioned in the purchase order. The supplies still regard the only facility in Talamona.

3.0 Responsibility

Responsibility for the update of this procedure is MFG Quality Leader Talamona. This specification is part of the Baker Hughes Quality Management System.

4.0 Documents applicable

4.1 Baker Hughes Documents

- BH-SOU-001 Supplier Quality Requirements

4.2 International Standards

- AS/EN 9100 QMS - Requirements for Aviation, Space and Defense Organization.
- AS 9102 Aerospace First Article Inspection Requirements
- ISO 9001 Quality Management System - Requirements

5.0 General Quality Requirements for all suppliers

5.1 Risk mitigation (see Annex reference Att. I-8.4.1)

In order to mitigate the risk on goods and services provided to Baker Hughes supplier must:

- fulfill under the terms of the purchase order
- fulfill all quality requirements
- Comply with the requirements for safety and environmental protection
- Keep a time communication and training process to ensure staff awareness of their contribution to the conformity of products / services, Product Safety and the importance of ethical behavior.
- Maintain a process for analyzing risk of obsolescence of the product supplied.

5.2 Statistical Process Control (Att. I-8.4.3-j)

In addition to what is already required in specific BH-SOU-001, the Baker Hughes suppliers must identify key features of the manufacturing process and apply a statistical process control to them. Baker Hughes may request the supplier to produce periodic reports for statistical parameters.

5.3 Quality Management System (Att. I-8.4.3-k-1)

The Baker Hughes Suppliers, for which it is required to follow this procedure, must meet the requirements of international standards AS/EN 9100 latest revision, incorporating the International Standard ISO 9001 latest revision.

The fulfillment by suppliers of the requirements of international standards

AS/EN 9100 is demonstrated by achieving the certification of its Quality Management, according to the above rules, issued by an accredited system, established under the International Aerospace Quality Group (IAGQ) and recorded in the Online site Aerospace Supplier Information System (OASIS).

For parts suppliers and services imposed by the client or performing roughing operations on parts supplied by Baker Hughes, compliance to ISO 9001 latest revision can be accepted in conjunction with the requirements of this specification.

Baker Hughes requires that the quality management system meets the AS/EN 9100 requirements (latest edition) and be made available to Baker Hughes for review upon request.

Baker Hughes reserves the right to request; a) a compliance AS/EN 9100 audit to be performed at the expense of the supplier by a third-party service designated by Baker Hughes b) certification AS/EN 9100 within a specified period of time (usually one year from 'approval).

5.4 Counterfeit parts (Att. I-8.4.3-k-4)

Counterfeit Parts Definition: counterfeit products are products that represent a copy, imitation, alteration of parts identified or marked as genuine by the source without the legal right to do so. In addition, any part identified by inspection or by a test that may have been distorted by the supplier or manufacturer and could therefore meet the definition of counterfeiting.

The Supplier shall maintain a Quality Management System to detect and eliminate the presence of counterfeit parts, including the training of employees about the awareness of their contribution to safety/product conformity, to standards of ethical behavior and reporting any non-conformities. The supplier must have processes to

ensure traceability of the product, reducing parts of the counterfeit prevention requirements, inspection and testing of parts, quarantine and reporting of suspected counterfeit parts. The supplier must quarantine the suspected counterfeit part waiting for a resolution and make it available for the investigation. If the supplier becomes aware of a counterfeit part, confirmed or suspected, that may have been delivered, the Supplier shall notify to Baker Hughes within 48 hours the identification of the counterfeit part and the corrective actions.

5.5 Preservation of Quality Record (Att. I-8.4.3-k-8)

The records retention period is permanent, unless otherwise specified by Baker Hughes. The records must include, but are not limited to, product quality or inspection plans and tests and results, material specification, qualification documentation and certificates of conformity. Specific requirements may be specified by Baker Hughes in the purchase order, contract or specifications. It is the responsibility of the manufacturer to determine proper storage in order to meet the requirement of maintaining and enable the timely retrieval of records. In all cases, the provider must inform Baker Hughes before disposal or destruction of documents relating to Baker Hughes supplies.

5.6 Inspection and Auditing (Att. I-8.4.3-l)

Baker Hughes and/or Baker Hughes and/representatives or Baker Hughes customers and/or Control Authority reserve the right to have access to the Supplier's premises or its subcontractor (at any level) for compliance audits, including access to applicable documents.

Baker Hughes provides reasonable notice to the supplier before any agreed audit. Baker Hughes and/or his designated inspector can perform the inspection supervision at the premises of suppliers and sub-suppliers in accordance with the approved PQP/ITP. However, Baker Hughes reserves the right to modify the inspection and the frequency of visits as deemed necessary.

5.7 Foreign object damage -FOD- (Att. I-8.5.1-o)

The Supplier must comply with all the product requirements and process specified on the drawings, standards mentioned in them and/or applicable and possible processing cycles supplied by Baker Hughes. Furthermore, the Supplier must take care to implement the necessary methods to prevent the risk of FOD (Foreign Object Damage) or of contamination of the products, during either processing or handling and storage phases. To this regards Baker Hughes reserves the right to require the Supplier a prevention plan of the FOD depending on the geometry and the criticality of the component in order.

5.8 First Article Inspection –FAI– (Att. I-8.5.1.3)

- 5.8.1 The First Article Inspection (FAI) must be made in accordance with standard AS 9102 (Appendix 1). The Supplier is responsible for ensuring the availability of the relative to the FAI data for all the characteristics of the finished product generated by its Suppliers. Baker Hughes reserves the right to conduct on-site audits on the FAI to confirm compliance with the requirements applicable to the product. If deemed necessary, Baker Hughes may require the execution of the FAI complete or partial even when it had not been originally planned.
- 5.8.2 The Supplier must perform dimensional controls on 100% of the lots and record in appropriate datasheets already used as FAI the results obtained in the process of monitoring and measurement of the product during the manufacturing process. The Supplier must ensure the accountability of all the features on the aforementioned datasheets. Furthermore, for critical classified characteristics (CTP/CTQ) should always be registered with the values obtained. In the case of complete parts or individual parts of the serialized Supplier must record the values measured with reference to each individual component. In the case of individual not serialized parts, the tracking shall be registered into the datasheets by indicating the maximum and minimum values measured in the batch, except if differently requested by applicable CTP / CTQ.

6.0 Terms and Definitions

For terms and definitions in this specification refer BH-SOU-001.

7.0 Annex

Annex I – AS/EN 9100 Requirements Comparison table

Table of comparison of Requirements between AS/EN 9100:2016 and BH-SOU-001

AS/EN 9100:2016 vs BH-SOU-001 rev.4

AS/EN 9100:2016	BH-SOU-001 rev .4	Add. su ARSB-O&G-006
8.4.1 General		
The organization shall identify and manage the risks associated with the external provision of processes, products, and services, as well as the selection and use of external providers (e.g., direct and sub-tier external providers, sources identified by the customer)	<i>partially covered</i>	Added point (par. 5.1)
8.4.3 Information for External Providers		
a. the processes, products, and services to be provided including the identification of relevant technical data (e.g., specifications, drawings, process requirements, work instructions);	<i>covered</i>	
b. the approval of: 1. products and services; 2. methods, processes, and equipment; 3. the release of products and services;	<i>covered</i>	
c. competence, including any required qualification of persons;	<i>covered</i>	
d. the external providers' interactions with the organization;	<i>covered</i>	
e. control and monitoring of the external providers' performance to be applied by the organization;	<i>covered</i>	

AS/EN 9100:2016	BH-SOU-001 rev .4	Add. su ARSB-O&G-006
f. verification or validation activities that the organization, or its customer, intends to perform at the external providers' premises;	<i>covered</i>	
g. design and development control	<i>covered</i>	Supplier qualified ISO9001 - AS/EN 9100
h. special requirements, critical items, or key characteristics;	<i>covered</i>	
i. test, inspection, and verification (including production process verification);	<i>covered</i>	
j. the use of statistical techniques for product acceptance and related instructions for acceptance by the organization;	<i>partially covered</i>	Added point (par. 5.2)

AS/EN 9100:2016	BH-SOU-001 rev .4	Add. su ARSB-O&G-006
<p>k. the need to:</p> <ol style="list-style-type: none"> 1. implement a quality management system; 2. use customer-designated or approved external providers, including process sources (e.g., special processes); 3. notify the organization of nonconforming processes, products, or services and obtain approval for their disposition; 4. prevent the use of counterfeit parts (see 8.1.4); 5. notify the organization of changes to processes, products, or services, including changes of their external providers or location of manufacture, and obtain the organization’s approval; 6. flow down to external providers applicable requirements including customer requirements; 7. provide test specimens for design approval, inspection/verification, investigation, or auditing; 8. retain documented information, including retention periods and disposition requirements; 	<p><i>partially covered</i></p>	<p>Added points: 1, par. 5.3 4, par. 5.4 8, par. 5.5.</p>
<p>l. the right of access by the organization, their customer, and regulatory authorities to the applicable areas of facilities and to applicable documented information, at any level of the supply chain;</p>	<p><i>partially covered</i></p>	<p>Added point (par. 5.6)</p>

AS/EN 9100:2016	BH-SOU-001 rev .4	Add. su ARSB-O&G-006
m. ensuring that persons are aware of: 1. their contribution to product or service conformity; 2. their contribution to product safety; 3. the importance of ethical behavior.	<i>partially covered</i>	Added points: 2, 3 (par. 5.4)
<u>8.5.1 Control of Production and Service Provision</u>		
o. the provision for the prevention, detection, and removal of foreign objects; (FOD)	<i>not covered</i>	Added point (par. 5.7)
<u>8.5.1.3 Production Process Verification</u>		
This activity can be referred to as First Article Inspection (FAI)	<i>partially covered</i>	Added point (par. 5.8)