International Association of Oil & Gas Producers

SPECIFICATION
S-619Q

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2018

Quality Requirements for Unfired, Fusion Welded Pressure Vessels

Revision history

VERSION	DATE	AMENDMENTS
1.0	December 2018	Issued for Publication

Acknowledgements

This IOGP Specification was prepared by a Joint Industry Project 33 Standardization of Equipment Specifications for Procurement organized by IOGP with support by the World Economic Forum (WEF).

Foreword

This specification was prepared under a Joint Industry Project 33 (JIP33) “Standardization of Equipment Specifications for Procurement” organized by the International Oil & Gas Producers Association (IOGP) with the support from the World Economic Forum (WEF). Ten key oil and gas companies from the IOGP membership participated in developing this specification under JIP33 Phase 2 with the objective to leverage and improve industry level standardization for projects globally in the oil and gas sector. The work has developed a minimized set of supplementary requirements for procurement, with life cycle cost in mind, based on the ten participating members’ company specifications, resulting in a common and jointly approved specification, and building on recognized industry and international standards.

This specification has been developed in consultation with a broad user and supplier base to promote the opportunity to realize benefits from standardization and achieve significant cost reductions for upstream project costs. The JIP33 work groups performed their activities in accordance with IOGP’s Competition Law Guidelines (November 2014).

Recent trends in oil and gas projects have demonstrated substantial budget and schedule overruns. The Oil and Gas Community within the World Economic Forum (WEF) has implemented a Capital Project Complexity (CPC) initiative which seeks to drive a structural reduction in upstream project costs with a focus on industry-wide, non-competitive collaboration and standardization. The vision from the CPC industry is to standardize specifications for global procurement for equipment and packages, facilitating improved standardization of major projects across the globe. While individual oil and gas companies have been improving standardization within their own businesses, this has limited value potential and the industry lags behind other industries and has eroded value by creating bespoke components in projects.

Following agreement of the relevant JIP33 work group and approval by the JIP33 Steering Committee, the IOGP Management Committee has agreed to the publication of this specification by IOGP. Where adopted by the individual operating companies, this specification and associated documentation aims to supersede existing company documentation for the purpose of industry-harmonized standardization.

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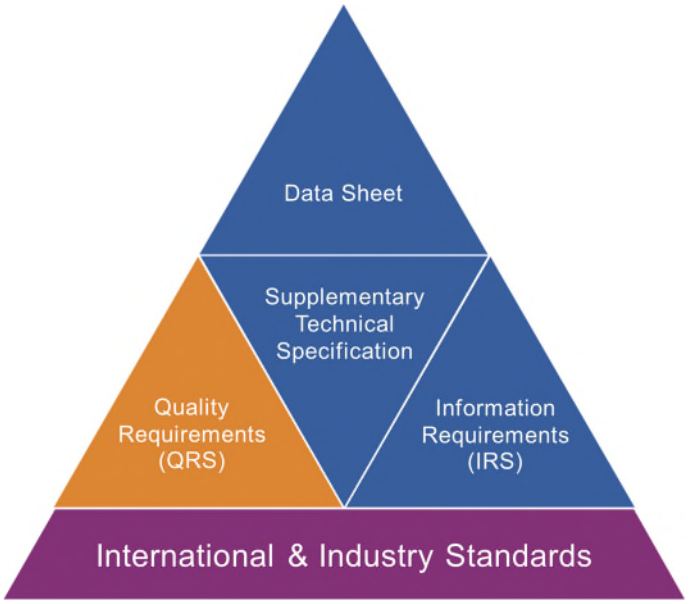
Introduction

The purpose of this quality requirements specification (QRS) is to define quality management requirements for the supply of unfired, fusion welded pressure vessels for use in the petroleum and natural gas industries.

The QRS includes a conformity assessment system (CAS) which specifies standardized user interventions against quality management activities at four different levels. The applicable CAS level is specified by the user in the equipment datasheet.

This QRS shall be used in conjunction with the supplementary specification (S-619), information requirements (S-619L) and data sheets (S-619D) which together comprise the full set of specification documents. The Introduction section in the supplementary requirements provides further information on the purpose of each of these documents and the order of precedence for their use.



JIP33 Specification for Procurement Documents
Supplementary Technical Specification

1 Scope

The purpose of this specification is to specify quality management requirements for the supply of unfired fusion welded pressure vessels including:

a) manufacturer quality management system requirements;

b) customer conformity assessment (surveillance and inspection) activities;

c) traceability requirements;

d) evidence of conformance.

2 Normative references

For the purpose of this document, the documents referenced in IOGP S-619 and those listed below, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9001:2015	Quality management systems - Requirements
API Specification Q1	Specification for Quality Management System Requirements for Manufacturing Organisations for the Petroleum and Natural Gas Industry
S-619	Specification for unfired, fusion welded pressure vessels

3 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 9000:2015 (normative to ISO 9001:2015) and the following shall apply. To align with the terminology used in S-619 the term “purchaser” is used in place of “customer” and the term “vendor” in place of “supplier”:

3.1 Conformity assessment

Demonstration that requirements relating to a product, process, system, person or body are fulfilled.

NOTE 1 Conformity assessment (or assessment) includes but is not limited to review, inspection, verification and validation activities.

NOTE 2 Assessment activities may be undertaken at a vendor or sub-vendor’s premises, virtually by video link, desktop sharing etc. or by review of information formally submitted for acceptance or for information.

3.2 Conformity assessment system (CAS)

Systems providing different levels of assessment of the vendor’s control activities by the purchaser (second party) or independent body (third party) based on evaluation of the vendor’s capability to conform to the product or service specification and obligatory requirements. The applicable CAS level is specified by the purchaser in the data sheet.

NOTE CAS A reflects the highest risk and associated extent of verification. CAS D is the lowest.

3.3 Conformity assessment - hold point (H)

Point in the chain of activities beyond which an activity shall not proceed without the approval of the purchaser or purchaser’s representative.

3.4 Conformity assessment - witness point (W)

Point in the chain of activities that the vendor shall notify the purchaser or purchaser's representative before proceeding. The operation or process may proceed without witness if the purchaser or purchaser's representative does not attend after the agreed notice period.

3.5 Conformity assessment – surveillance (S)

Observation, monitoring or review by the purchaser or purchaser's representative of an activity, operation, process or associated information.

3.6 Conformity assessment – review (R)

Review of the vendor's documentation by the purchaser or purchaser's representative to verify conformance to requirements.

NOTE Information review requirements are managed on a surveillance basis, and as such do not impose schedule constraints, unless specified as hold points in Annex A, or as conditions specified in the associated IRS

4 Symbols and abbreviations

For purposes of this document, the following abbreviation applies:

CAS Conformity Assessment System

IRS Information Requirements specification

QRS Quality Requirements Specification (this document)

5 Quality Requirements

5.1 Quality management system

The vendor shall demonstrate that the quality management arrangements established for the supply of products or services conform to ISO 9001:2015, API Specification Q1 or equivalent quality management system standard agreed with the purchaser.

5.2 Conformity assessment

Quality plans or inspection and test plans developed as outputs to operational planning and control for the products or services shall define the specific controls to be implemented by the vendor and when applicable, sub-vendors, to ensure conformity with the specified requirements.

Controls will address both internally and externally sourced processes, products and services

Quality plans and inspection and test plans shall include provisions for the purchaser's CAS; see Annex A, as specified in the data sheet or purchase order.

Vendor performance in meeting the requirements will be routinely assessed during execution of the scope and where appropriate, corrective action requested and the level of conformity assessment increased or decreased consistent with criticality and risk.

NOTE 1 For industrial well proven solutions CAS level D is specified unless risk assessment indicates that a more stringent CAS-level is required.

NOTE 2 Irrespective of the CAS level defined by the purchaser, either, by reference to standard and specification requirements or in the scope, the vendor remains responsible for operational planning and control and demonstration of the conformity of products and services with the requirements (see ISO 9001, 8.1, 8.2).

6 Traceability

Material certification and traceability shall be provided in accordance with Annex B. Material inspection certificates shall be provided in accordance with Table 1 of ISO 10474 or Table A.1 of EN 10204.

7 Control of nonconforming products and services

Nonconformance with specified requirements identified by or to the vendor prior to or during the delivery of the products and services shall be corrected such that the specified requirements are satisfied or the purchaser's acceptance of the nonconformance agreed in accordance with purchase order conditions.

NOTE See ISO 9001, 8.2.3, 8.2.4, 8.5.6 and 8.7

8 Evidence (records)

Plans, procedures, methods, resultant records shall be provided in accordance with the associated IRS.

Annex A Purchaser conformity assessment requirements

This annex defines four CAS or levels of purchaser assessment.

The vendor shall provide for the specified CAS when developing quality plans and inspection and test plans in accordance with Section 5.

	VENDOR CONTROL ACTIVITIES	CAS			
		A	B	C	D
1	**Planning and Control Activities**				
1.1	Quality plan (ISO 9001, 8.1 and ISO 10005)	H	H	R	
1.2	Inspection and test plan (ISO 9001, 8.1 and ISO 10005)	H	H	R	R
1.3	Technical kick-off meeting,	H	W	W	
1.4	Pre-production meeting and pre-inspection meeting	H	H	W	
2	**Design and Development Activities**				
2.1	General arrangement drawing, design calculation and detailed drawings (ISO 9001, 8.3)	H	H	R	R
2.2	Welding book (WPS and WPQR) (code requirement)	H	H	R	
2.3	Non-destructive examination procedure (code requirement)	H	R	R	
2.4	Heat treatment procedure (code requirement)	H	R	R	
3	**Materials and Component Manufacturing**				
3.1	Inspection and identification of materials and consumables: certification (including heat treatment certification), chemical and mechanical properties, testing and conformity (code requirement; S-619, 6, A.2, A.10, B.3.3, C.3, C.4, C.5, C.8, D.1.1, D.1.2, D.1.3, D.6.1)	H	R	R	
3.2	**Fabrication requirements (code requirement)**				
3.2.1	Cutting, fitting, assembly and marking of components (code requirement)(code requirement)	S	S		
3.2.2	Forming of pressure parts (code requirement)	W	S		
3.2.3	Set up, material traceability, tack welding, welding, fabrication and assembly of components (code requirements)	W	S	S	
3.2.4	Repair of defects in materials (code requirement; S-619, 6.6, 7.1.11, 7.2.14)	H	W	R	R
3.2.5	Heat treatments (code requirement)	W	R	R	
3.3	**Inspection, testing and verification activities ((code requirement)**				
3.3.1	Welder qualifications (code requirement)	W	W	S	
3.3.2	Non-destructive examination personnel qualifications (code requirement)	R	R	R	
3.3.3	Non-destructive examination personnel qualifications of personnel performing ultrasonic examination in lieu of radiographic examination (code requirement)	H	W	R	
3.3.4	Ferrite testing				
3.3.5	Production weld hardness testing				
3.3.6	Non-destructive examination of materials (code requirement; S-619, 5.7.1, 7.1.8, 9, A.4, A.5, B.3.11, C.1, C.2)	W	S	R	

3.3.7	Non-destructive examination of welds (code requirement; S-619, 7.1.6, 7.2.8, 9, B.1.5.2, B.3.5, B.3.6, B.3.8, B.3.9, B.3.10, B.3.11, D.3, D.6.3)	H	S	R	
3.3.8	Visual and dimensional inspection (including fabrication tolerances) of all of the vessel (code requirement; S-619, 5.8.4, 7.1.11, Annex E)	W	S	R	
3.3.9	Hydrostatic or pneumatic testing (code requirement; S-619 9, B.1.9, C.9, D.2.6)	W	R	R	
3.3.10	Surface preparation for painting	Refer to purchase order			
3.3.10	Painting, fire protection or lagging	Refer to purchase order			
4	**Release of Product or Service**				
	Verify conformance to the purchase order including as applicable;				
4.1	Final inspection including nameplate and stamping (if applicable)	H	W	R	
4.2	Preservation, packing and storage	H	W	S	
4.3	Final documentation review; as per IRS	R	R	R	R
4.4	Release note	H	H	H	H
	H is hold point, R is review, S is surveillance, and W is witness point. Note: Definitions for these terms are provided in Section 3 to this document.				

Annex B Material traceability and certification requirements

Item		Certificate type	Material traceability level	Additional requirements
Pressure Vessel	Pressure retaining and structural metals such as shell, heads, pipe fittings, davits, welded internal and external attachments, saddles, skirts and support legs.	3.1	Level II	Type 3.2 Certification is applicable as per the Design Requirements
	Welding consumables	2.2	Level III	
	Removable Internals	2.2	Level III	

Explanatory notes:

Material Inspection Certificates shall be provided in accordance with ISO10474 or EN10204.

A. "2.1" Declaration of Compliance with the PO - A document in which the Supplier declares that the products supplied are in compliance with the requirements of the PO, without inclusion of any test results.

B. "2.2" Test Report - A document in which the Supplier declares that the products supplied are in compliance with the requirements of the PO, and in which test results are supplied based on non-specific inspection and testing.

C. "3.1" Inspection Certificate - A document with test results based on specific inspection and testing, issued by the Supplier and validated by the Supplier's authorised inspection representative independent of the manufacturing department.

D. "3.2" Inspection Certificate - A document prepared by both the Supplier's authorised inspection representative, independent of the manufacturing department, and either the Customer nominated representative or the inspector designated by the regulations in which they declare that the products supplied are in compliance with the requirements of the order and for which test results are supplied.

E. Additionally, Customer has specified that all material product testing associated with "3.2" Inspection Certificates shall be performed in the presence of either a Customer nominated representative or the inspector designated by the regulations, and the resultant test report stamped as "Witnessed". Failure to adhere to this requirement may lead to rejection of all material(s) being qualified for production.

F. Level I - Full Traceability - Material is uniquely identified and its history tracked from manufacture through stockist (where applicable) to Supplier and to actual position on the equipment with specific location defined on a material placement record. (The traceability to a specific location only applies to skids / packaged equipment, not to bulks)

G. Level II - Type Traceability - Supplier maintains a system to identify material throughout manufacture, with traceability to a material certificate.

H. Level III - Compliance Traceability - Supplier maintains a system of traceability that enables a Declaration of Compliance to be issued.

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