

Quality Requirements for Subsea Trees

Revision history

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Foreword

This specification package 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/or international standards.

The specification package 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. The specification package aims to significantly reduce this waste, decrease project costs and improve schedule through pre-competitive collaboration on standardization.

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 package by IOGP. Where adopted by the individual operating companies, the specification package aims to supersede existing company documentation for the purpose of industry-harmonized standardization.

This document was previously issued as Purchase Order Quality Requirements (POQR) for API 17D Subsea Trees. Phase 2 of the JIP33 project introduced this replacement Quality Requirements Specification (QRS). The revision numbering of this QRS follows on from the POQR.

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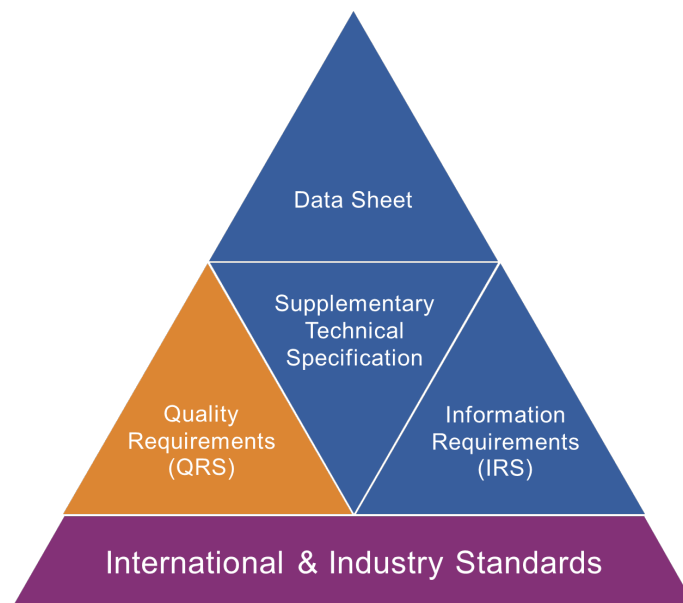
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Introduction

The purpose of this quality requirements specification (QRS) is to define quality management requirements for the supply of subsea trees in accordance with IOGP-S-561 Supplementary Specification to API Specification 17D, for application 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 requirements specification (IOGP S-561), information requirements specification (IOGP S-561L) and equipment datasheet (IOGP S-561D) which together comprise the full set of specification documents. The Introduction section in the supplementary requirements specification provides further information on the purpose of each of these documents and the order of precedence for their use.



JIP33 Specification for Procurement Documents Quality Requirements Specification

1 Scope

To specify quality management requirements for the supply of subsea trees to IOGP-S-561 Supplementary Requirements to API specification 17D Subsea Trees including:

- a) manufacturer quality management system requirements;
- b) purchaser 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-561 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 Organizations for the Petroleum and Natural Gas Industry
IOGP-S-561	Supplementary Requirements to API specification 17D Subsea Trees

3 Terms and definitions

For the purpose of this document, the terms and definitions given in IOGP-S-561, ISO 9000:2015 (normative to ISO 9001:2015) and the following shall apply.

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 manufacturer's or sub-manufacturer'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 supplier's control activities by the purchaser (second party) or independent body (third party) based on evaluation of the supplier's capability to conform to the product or service specification, product specification level (PSL) and obligatory requirements.

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

3.3 Conformity assessment - hold point

The point in the chain of activities beyond which an activity shall not proceed without the approval of purchaser / purchaser's representative.

3.4 Conformity assessment - witness point

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

3.5 Conformity assessment - surveillance

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

3.6 Conformity assessment - review

Review of the supplier's information 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.

3.7 Critical

That deemed by the organization, product specification or customer as mandatory, indispensable or essential, needed for a stated purpose or task, and requiring specific action.

3.8 Product specification level (PSL)

Level defining the extent of control activities, typically including verification, inspection and testing to be undertaken by supplier to demonstrate conformance with requirements based on determination of service risk or obligations.

4 Symbols and abbreviations

For purposes of this document, the following symbols and abbreviations apply:

CAS	Conformity assessment system
PSL	Product specification level

5 Quality requirements

5.1 Quality management system

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

5.2 Conformance assessment

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

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

Quality plans and inspection and test plans shall include provision for:

- a) Product specification level (PSL) three (PSL 3) or three G (PSL 3G) as specified in the subsea tree datasheet and in accordance with supplementary requirements to API 17D (IOGP S-561).

- b) The purchaser's conformity assessment system (CAS) as specified in the purchase order or subsea tree datasheet; see Annex A.

The supplier's performance in meeting the requirements will be routinely assessed during execution of the scope and where appropriate, corrective action requested and conformity assessment activities 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 conformity assessment requirements defined by the purchaser, either by reference to standard and specification requirements, or in the scope, the manufacturer remains responsible for operational planning and control and demonstration of the conformity of products and services with the requirements (see ISO 9001, 8.1 and 8.2).

6 Traceability

Material certification and traceability shall be maintained in accordance with IOGP S-561, 5.2.2.

7 Control of nonconforming products and services

Nonconformance with specified requirements identified by or to supplier prior to or during the delivery of the products and services shall be corrected such that the specified requirements are satisfied or the customer's acceptance of the nonconformance agreed in accordance with purchase order conditions. See ISO 9001:2015, 8.2.3, 8.2.4, 8.5.6 and 8.7.

8 Evidence (conformance records)

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

Annex A Purchaser conformity assessment requirements

This annex defines four conformity assessment systems (CAS) or levels of purchaser assessment.

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

	PURCHASER ASSESSMENT ACTIVITIES	CAS			
		A	B	C	D
1	Operational planning and control activities				
1.1	Quality plan (ISO9001, 8.1 and ISO10005) (Note 2)	H	H	H	H
1.2	Inspection and test plan (ISO9001, 8.1 and ISO10005) (Note 2)	H	H	H	H
2	Design and development activities				
2.1	Verification of design activities (Note 2)	H	H	H	H
2.2	Review of equipment qualification (Note 2)	H	H	H	H
2.3	Process Qualification / Requalification including:				
2.3.1	Forging Qualification Low Alloy Steel (IOGP S-561, DNVGL-RP-0034 and B202)	R	R	R	-
2.3.2	Forging Qualification – Other (IOGP S-561, manufacturer approved documentation)	R	R	R	-
2.3.3	Welding Qualification (API 17D, manufacturer approved documentation)	R	R	R	-
2.3.3.1	Pressure containing including piping (API 17D)	R	R	R	-
2.3.3.2	Structural (manufacturer approved documentation)	R	R	R	-
2.3.4	Coating systems (manufacturer approved documentation)	R	R	R	-
3	Component manufacture and fabrication				
3.1	Manufacture pressure containing and controlling components: (valve blocks, valve/choke bodies & bonnets, connectors, tubing hangers)				
3.1.1	Manufacture of forged material	R	R	R	R
3.1.2	Input material identification, traceability and certification	R	R	R	R
3.1.3	Rough-out machine, pre-overlay	-	-	-	-
3.1.4	Overlay/PWHT/NDE operations	W	R	R	R
3.1.5	Finish machine / NDE operations	S	R	R	R
3.2	Structural fabrication (frame, etc.)				
3.2.1	Input material identification, traceability and certification review	R	R	R	R
3.2.2	Fabrication fit-up and dimensional control	-	-	-	-
3.2.3	Welding control, inspection and NDE (as per specified code)	S	R	R	R
3.2.4	Critical integration/installation dimensions	W	R	R	R
3.2.5	Lifted equipment load testing	W	R	R	R
3.3	Process piping fabrication (production & annulus bore flow spools)				
3.3.1	Input Material identification, traceability and certification review as per and Annex B	R	R	R	R
3.3.2	Fabrication fit-up and dimensional control	-	-	-	-
3.3.3	Welding control, inspection and NDE (as per specified code)	S	R	R	R
3.3.4	Critical integration/installation dimensions	S	-	-	-

	PURCHASER ASSESSMENT ACTIVITIES	CAS			
		A	B	C	D
3.3.5	Hydro testing	W	R	R	R
4	Sub-assemblies				
4.1	Verify brought in input components				
4.1.1	Fasteners (for pressure containing enclosures)	S	S	R	R
4.1.2	Small ball valves	S	S	R	R
4.1.3	Actuators	S	S	R	R
4.2	Valve block sub-assembly (MVB, etc.)				
4.2.1	Sub-assembly set out	W	W	R	R
4.2.2	Bolt torque verification	W	W	R	R
4.2.3	Sub-assembly factory acceptance testing	W	W	R	R
4.3	Connector sub-assembly (Tree and THS Connector)				
4.3.1	Sub-assembly set out	W	W	R	R
4.3.2	Bolt torque verification	W	W	R	R
4.3.3	Sub-assembly factory acceptance testing	W	W	R	R
5	Major assemblies including subsea tree, tubing head spool, tubing hanger and tree caps				
5.1	Top level assembly set out	W	W	R	R
5.2	Small bore welding NDE	W	W	R	R
5.3	FAT testing	W	W	W	R
5.3.1	Drift test	W	W	W	R
5.3.2	Bolt torque verification	S	S	S	R
5.3.3	Continuity test	S	S	S	R
5.3.4	Flushing and cleanliness testing	S	S	S	R
5.4	Review lifting/sea fastening attachments and certification	S	S	S	R
5.5	Coating / Painting / Insulation Inspection	S	S	S	R
5.6	EFAT	W	W	W	S
5.6.1	ROV tooling interface tests	S	S	S	R
6	Release of product or service				
6.1	Verify conformance to purchase order, including as applicable				
6.1.1	Weight and Inclination	S	S	S	S
6.1.2	Loose ship item, spares special tools as applicable	S	S	S	S
6.1.3	Handling, preservation and packaging	S	S	S	S
6.1.4	Final documentation; as per IRS S-561L (Note 2)	H	H	H	H
6.2	Final Pre shipping Inspection	H	H	H	H
	H is hold point, W is witness point, S is surveillance, R is review and N/A Not Applicable NOTE 1 Definitions for these terms are provided in Clause 3. Reviews may be undertaken on a continuous basis. NOTE 2 Hold means that the document must be available prior to commencement of related activities. Approval requirements for these documents are defined in the IRS (S-561L).				

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