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Quality requirements for Welding

JIP33
JOINT INDUSTRY PROGRAMME

Revision history

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0.1	October 2019	Issued for public review

Acknowledgements

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Foreword

This specification was prepared under a Joint Industry Programme 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). Companies from the IOGP membership participated in developing this specification 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, resulting in a common and jointly approved specification, building on recognized industry and/or international standards.

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 CPC vision is to standardize specifications for global procurement for equipment and packages, facilitating improved standardization of major projects across the globe. JIP33 provides the oil and gas sector with the opportunity to move from internally to externally focused standardisation initiatives and provide step change benefits in the sector's capital projects performance.

This specification has been developed in consultation with a broad user and supplier base to realize benefits from standardization and achieve significant project and schedule cost reductions.

The JIP33 work groups performed their activities in accordance with IOGP's Competition Law Guidelines (November 2014).

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Introduction

The purpose of this quality requirements specification (QRS) is to define quality management requirements for welding in accordance with API Recommended Practice 582 Welding Guidelines for the Chemical, Oil, and Gas Industries for application in the petroleum and natural gas industries.

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

This QRS shall be used in conjunction with the supplementary requirements specification (IOGP S-705), the information requirements specification (IOGP S-705L) and the datasheet (IOGP S-705D) 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 for noise emitting equipment in accordance with Supplementary Specification to API Recommended Practice 582 Welding Guidelines for the Chemical, Oil, and Gas Industries for application in the petroleum and natural gas industries including:

a) supplier quality management system requirements;

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

c) traceability requirements;

d) evidence of conformance.

2 Normative References

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
API Recommended Practice 582	Welding Guidelines for the Chemical, Oil, and Gas Industries
IOGP S-705	Supplementary Specification to API Recommended Practice 582 Welding Guidelines for the Chemical, Oil, and Gas Industries

3 Terms and Definitions

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 supplier/sub-supplier'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 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 the purchaser or purchaser's representative.

3.4 Conformity assessment - witness point

The point in the chain of activities that the supplier shall notify the purchaser or 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 or 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.

4 Symbols and abbreviations

CAS	Conformity assessment system
IRS	Information requirements specification
QRS	Quality requirements specification (this document)

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

5.2.1

Quality and inspection plans and test plans developed 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.

5.2.2

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

5.2.3

Quality plans and inspection plans and test plans shall include provision for the purchaser conformity assessment system (CAS) as specified in the data sheet; see Annex A.

5.2.4

Supplier 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 or specification requirements or in the scope, the supplier remains responsible for operational planning and control and demonstration of the conformity of products and services with the requirements (see ISO 9001:2015, 8.1 and 8.2).

6 Traceability

Material certification and traceability shall be maintained in accordance with Annex B.

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 purchaser'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 (records)

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

Annex A
(normative)
Purchaser conformity assessment requirements

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

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

	PURCHASER ASSESSMENT ACTIVITIES	CAS			
		A	B	C	D
1	**Planning and control activities**				
1.1	Inspection and test plan (ISO 9001, 8.1; ISO 10005; IOGP S-705, 12.2.2)	H	H	W	R
1.2	Welding interruption procedure (IOGP S-705, 8.13.1, 8.13.2, 8.13.3, 8.13.4, 8.13.5)	R	R	R	-
1.3	Interpass temperature procedure (IOGP S-705, 8.3, 8.7)	R	R	R	-
1.4	Consumable control procedure (IOGP S-705, 6.6.4, 6.6.5, 6.6.6, 6.6.7, 6.6.8, 6.6.9, 6.6.10, 6.8.1, 6.8.4, 6.8.5, 6.8.6)	R	R	R	-
1.5	Cleaning and surface preparation procedure (IOGP S-705, 10.5, 10.10, 10.11, 10.12, 10.14, 10.15)	R	R	R	-
1.6	Tacking procedure (IOGP S-705, 12.10.4, 12.10.5)	R	R	R	-
1.7	Weld proximity procedure (IOGP S-705, 12.14.1, 12.14.2, 12.14.3)	R	R	R	-
1.8	Slag removal procedure (IOGP S-705, 10.5)	R	R	R	-
2	**Design and development activities**				
2.1	Welding Procedure Specifications (WPSs) (IOGP S-705)	R	R	-	-
2.2	Welding Procedure Qualification Records (PQRs) (IOGP S-705)	R	R	-	-
2.3	Weld map (IOGP S-705, 4.8, 12.7, 12.9, 12.14.1, 12.14.2)	R	R	-	-
2.4	Post weld heat treatment (PWHT) procedure (IOGP S-705, 9.12, 9.15, 9.16, 9.20, 9.21, 9.22, 9.23, 9.24, 9.25, 9.26, 9.3, B.1.11)	H	W	R	-
2.5	Preheating procedure (IOGP S-705, 8.3, 8.8, 8.10, 8.11, 8.12)	R	R	-	-
2.6	Positive Material Identification (PMI) procedure (IOGP S-705, 6.9)	R	R	-	-
2.7	Weld consumable material certificate (IOGP S-705, 6.1.4, 6.1.7, 6.1.10, 6.1.11.1, 6.1.11.2, 6.1.11.3, 6.1.11.4, 6.1.12, 6.1.13, 6.1.14, 6.1.15, 6.2.3, 6.4.2.1, 6.4.2.6, 6.4.3, 6.4.4, 6.5.4, 6.5.5.1, 6.5.5.3, 6.5.5.4, 6.5.5.5, 6.6.11, Table 3)	R	R	-	-
2.8	Pickling and passivation procedure (IOGP S-705, 10.13)	R	R	-	-
2.9	Welding repair procedure (IOGP S-705, 11.9.1, 12.11.1, 12.11.2, 12.11.3, 12.11.4, 12.11.5, 12.11.6, 12.11.7)	H	H	R	R
2.10	Gas certificate (IOGP S-705, 7.4)	R	R	-	-
2.11	Welder certificate (IOGP S-705, 12.10.1)	R	R	-	-
3	**Control of external supply**				
3.1	External supply scope, risk assessment and controls (ISO 9001, 8.4)	R	R	R	-
4	**Production and service provision**				

	PURCHASER ASSESSMENT ACTIVITIES	CAS			
		A	B	C	D
4.1	Visual inspection of weld (IOGP S-705, 5.3, 7.8.1, 7.8.3, 7.8.4, 7.8.5, Table 8, Table 9, 12.10.3)	W	W	S	-
4.2	Welding traceability records (IOGP S-705, 12.11.3, 12.11.4)	R	R	-	-
4.3	Post weld heat treatment record (IOGP S-705, 9.17, 9.18, 9.19, 9.23, 9.24)	R	R	-	-
4.4	Hardness testing for PWHT verification record (IOGP S-705, 9.5)	R	R	-	-
4.5	Production ferrite measurement record (IOGP S-705, 12.8.2, B.3.3)	R	R	-	-
4.6	Production test record (IOGP S-705, 12.12.1, 12.12.2, 12.13.1, 12.13.2, 12.13.3)	R	R	-	-
4.7	Non-destructive examination (NDE) report (IOGP S-705, 8.13.2, 12.14.3)	R	R	-	-
4.8	Production hardness testing record (IOGP S-705, 12.6.1, 12.6.2, 12.6.3, 12.6.4)	R	R	-	-
5	**Release of product or service**				
5.1	Manufacturing Record Book (IOGP S-705, 12.8.3)	R	R	R	R
	H is hold point, W is witness point, S is surveillance and R is review. Note: Definitions for these terms are provided in Section 3 of this document.				

Annex B
(normative)
Material traceability and certification requirements

Item		Certificate Type	Material Traceability level	Additional Requirements
Welding Consumables	Electrodes, rods and wire	3.1	Level II	
	Flux	2.2	Level II	

Material inspection certificates shall be provided in accordance with Table 1 of ISO 10474 or Table A.1 of EN 10204.

Explanatory notes:

A. "2.2" Test Report - A document in which the vendor 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.
B. "3.1" Inspection Certificate - A document with test results based on specific inspection and testing, issued by the vendor and validated by the vendor's authorised inspection representative independent of the manufacturing department.
C. "3.2" Inspection Certificate - A document prepared by both the vendor's authorised inspection representative, independent of the manufacturing department, and either the purchaser 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.
D. Additionally, purchaser has specified that all material product testing associated with "3.2" Inspection Certificates be performed in the presence of either a purchaser 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.
E. Level I - Full Traceability - Material is uniquely identified and its history tracked from manufacture through stockist (where applicable) to vendor 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)
F. Level II - Type Traceability - vendor maintains a system to identify material throughout manufacture, with traceability to a material certificate.
G. Level III - Compliance Traceability - vendor maintains a system of traceability that enables a Declaration of Compliance to be issued.

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