International Association of Oil & Gas Producers

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2018

Quality Requirements for High-voltage switchgear and controlgear

Revision history

VERSION	DATE	AMENDMENTS
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Acknowledgements

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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.

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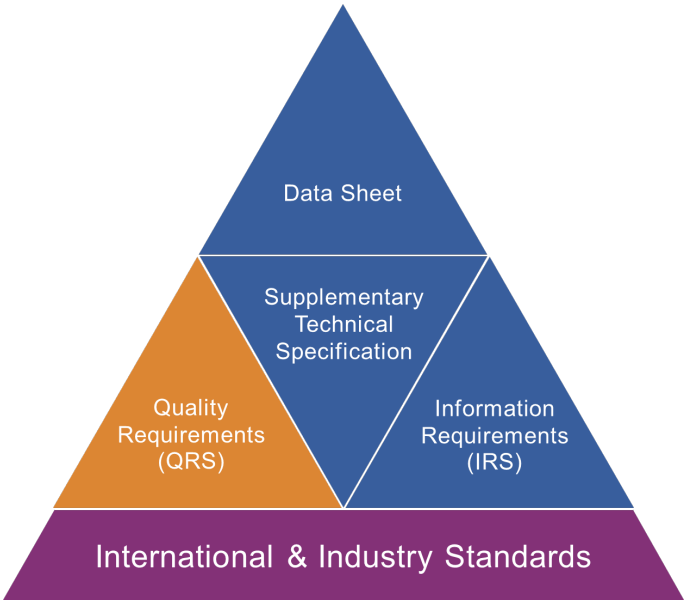
Introduction

The purpose of this quality requirements specification (QRS) is to define quality management requirements for the supply of high-voltage switchgear and controlgear in accordance with IOGP S-620 Supplementary Specification to IEC 62271-200 High-voltage switchgear and controlgear 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-620), the information requirements specification (IOGP S-620L) and the equipment data sheets (IOGP S-620D) 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

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1 Scope

To specify quality management requirements for the supply of high-voltage switchgear and controlgear to IOGP S-620 including:

a) manufacturer quality management system requirements;

b) user 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-620 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
IEC 62271-1:2017	High-voltage switchgear and controlgear Part 1: common specifications for alternating current switchgear
IEC 62271-200:2011	High-voltage switchgear and controlgear Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV
IOGP S-620	Supplementary Specification to IEC 62271-200 High-voltage switchgear and controlgear

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 definitions used in IEC 62271-1 and IEC 62271-200, the term “user” is used in place of “customer” and the term “manufacturer” in place of “supplier”.

3.1 Conformity assessment

Demonstration that requirements relating to a product, service, 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 or 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 manufacturer’s control activities by the user (second party) or independent body (third party) based on evaluation of the manufacturer’s capability to conform to

the product or service specification and obligatory requirements. The applicable CAS level is specified by the user in the data sheets.

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

3.3 Conformity assessment - hold point

Point in the chain of activities beyond which an activity shall not proceed without the approval of the user / user's representative.

3.4 Conformity assessment - witness point

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

3.5 Conformity assessment - surveillance

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

3.6 Conformity assessment - review

Review of the manufacturer's information by the user / user's representative to determine 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 manufacturer shall demonstrate that the quality management arrangements established for the supply of products and/or services conform to ISO 9001, API Specification Q1 or equivalent quality management system standard agreed with the user.

5.2 Conformance assessment

Quality plans and inspection 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 manufacturer and when applicable sub-manufacturers, to ensure conformance with the specified requirements.

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

Conformity assessment system (CAS): quality plans and/or inspection and test plans shall include provisions for the user CAS; see Annex A, as specified in the data sheet or purchase order.

Manufacturer 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 the CAS level defined by the user, 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/or services with the requirements (see of ISO 9001, 8.1, 8.2).

6 Traceability

The manufacturer shall maintain traceability of sub-assembly components including, but not limited to, high-voltage switches, high-voltage breakers, high voltage contactors, intelligent electronic devices (IEDs), bus ducts, voltage transformers and current transformers and fault current limiter to the original component manufacturer tag / serial number and where applicable, associated certification; see ISO 9001, 8.5.2.

7 Control of nonconforming products and services

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

8 Evidence (conformance records)

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

Annex A User conformity assessment requirements

This annex defines four CAS or levels of user assessment.

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

	USER ASSESSMENT ACTIVITIES	CAS			
		A	B	C	D
1	**Operational planning and control activities**				
1.1	Quality Plan (ISO 9001, 8.1 and ISO 10005)	H	H		
1.2	Inspection and Test Plan (ISO 9001, 8.1 and ISO 10005)	H	H	H	
1.3	Pre-assessment/inspection planning	H	W	W	
2	**Design and development activities**				
2.1	Declaration of conformity to the prototype of switchgear type tests (IOGP S-620, Clause 6) and all related clauses where applicable.	H	R	R	R
3	**Control of external supply**				
3.1	Control of externally provided processes, products and services (ISO 9001, 8.4)	H	R	R	
4	**Production and service provision**				
4.1	**Materials verification**				
4.1.1	Input material and components identification, traceability and certification	S	S	S	
4.2	**Assembly routine verification** (IOGP S-620, Clause 7)				
4.2.1	Dielectric test on the main circuit (IEC 62271-1, 8.1 and IEC 62271-200, 7.1)	W	S	S	
4.2.2	Test on auxiliary and control circuits (IEC 62271-1, 8.3 and IEC 62271-200, 7.2)	W	S	S	
4.2.3	Measurement of the resistance of the main circuits (IEC 62271-1, 8.4 and IEC 62271-200, 7.3)	W	S	S	
4.2.4	Tightness test (IEC 62271-1, 8.5 and IEC 62271-200, 7.4) - *[applicable to gas/liquid-filled assemblies only]*	W	S	S	
4.2.5	Design and visual checks (IOGP S-620, 7.5)	W	S	S	
4.2.6	Mechanical operation test (IEC 62271-200, 7.102)	W	S	S	
4.2.7	Pressure tests of gas compartments (IEC 62271-200, 7.103) *[applicable to gas filled assemblies only]*	W	S	S	
4.2.8	Tests of auxiliary electrical, pneumatic and hydraulic devices (IEC 62271-200, 7.104)	W	S	S	
4.3	**Switchgear special tests** (IOGP S-620, Clause 7) *[if included in scope as defined by the user in the data sheets]*				
4.3.1	Artificial pollution tests for outdoor insulators (IOGP S-620, 6.2.8)	W	W	S	
4.3.2	Partial discharge measurement (IEC 62271-1, 7.101)	W	W	S	
4.3.3	ECMS simulation test (IOGP S-620, 7.107)	H	W	S	

	USER ASSESSMENT ACTIVITIES	CAS			
		A	B	C	D
5	**Release of product or service**				
5.1	**Verify conformance to PO including as applicable**				
5.1.1	Weight	R	R	R	
5.1.2	Loose ship item, spares special tools as applicable	W	W	S	
5.1.3	Handling, preservation and packaging	W	W	S	
5.1.4	Final information review; as per IOGP S-620L	H	H	R	R
5.2	**Release equipment**	H	W	W	S
6	**Final inspection and testing** *[if included in scope as defined by the user in the purchase order]*				
6.1	**Tests after erection on site** (IEC 62271-1, 11.3.7 and IEC 62271-200, 7.105)	W	W	W	S
6.2	**Measurement of fluid condition after filling on** site (IEC 62271-200, 7.106) *[applicable to gas/liquid-filled assemblies only]*	W	W	W	S

NOTE 1 H is hold point, W is witness point, S is surveillance and R is review.

NOTE 2 Definitions for these terms are provided in Clause 3.

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