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Quality Requirements for Low-voltage Switchgear and Controlgear (IEC)

Revision history

VERSION	DATE	PURPOSE
3.0	December 2022	Third Edition
2.0	November 2016	Second Edition
1.0	June 2016	First Edition

Acknowledgements

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

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Foreword

This specification was prepared under 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 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 agreed specification, building on recognized industry and 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. JIP33 provides the oil and gas sector with the opportunity to move from internally to externally focused standardization 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 2020).

This third edition cancels and replaces the second edition published in November 2016.

Due to technical writing requirements leading to extensive changes, this third edition should be treated as a new document.

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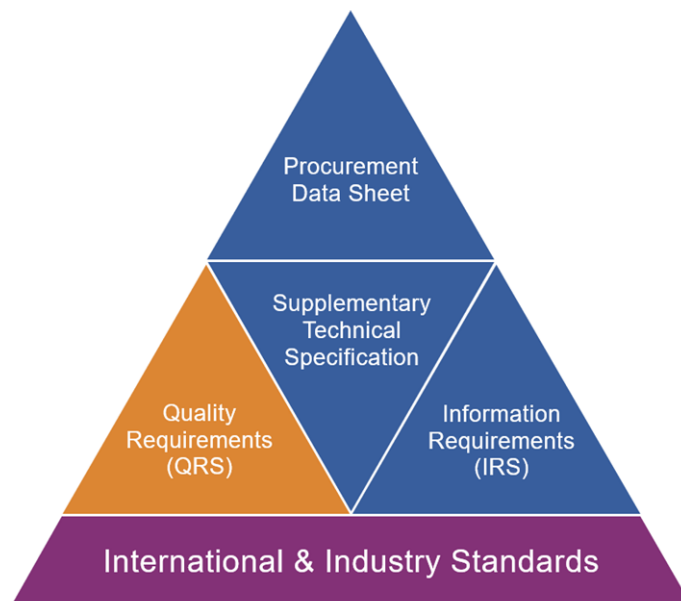
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Introduction

The purpose of this quality requirements specification (QRS) is to specify quality management requirements and the proposed extent of purchaser intervention activities for the procurement of low-voltage switchgear and controlgear in accordance with IOGP S-560 for application in the petroleum and natural gas industries.

Purchaser intervention activities are identified through the selection of one of four conformity assessment system (CAS) levels based on a risk and criticality assessment. The applicable CAS level is specified by the purchaser in the procurement data sheet or purchase order.

This QRS shall be used in conjunction with the specification (IOGP S-560), the procurement data sheet (IOGP S-560D) and the information requirements specification (IOGP S-560L) which together comprise the full set of specification documents. The introduction section in the 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 low-voltage switchgear and controlgear to IOGP S-560 including:

- a) manufacturer quality management system requirements;
- b) purchaser conformity assessment (surveillance and inspection) activities;
- c) traceability requirements.

2 Normative references

For the purpose of this document, the documents referenced in IOGP S-560 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.

API Specification Q1, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*

IOGP S-560, *Supplementary Specification to IEC 61439-1 and IEC 61439-2 for Low-voltage Switchgear and Controlgear*

ISO 9001, *Quality management systems — Requirements*

ISO 29001, *Petroleum, petrochemical and natural gas industries — Sector-specific quality management systems — Requirements for product and service supply organizations*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in IOGP S-560 and ISO 9000 (normative to ISO 9001), and the following shall apply.

3.1

conformity assessment

demonstration that specified requirements are fulfilled

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

Note 2 to entry: Assessment activities may be undertaken at a manufacturer's/sub-supplier's premises, virtually by video link, desktop sharing, etc. or by review of information.

3.2

conformity assessment system

CAS

system that provides different levels of purchaser interventions to assess and verify manufacturer conformance to specified requirements

Note 1 to entry: CAS A applies to the highest risk and associated extent of verification. CAS D is the lowest.

3.3

hold point

H

<conformity assessment> 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

witness point

W

<conformity assessment> point in the chain of activities that the manufacturer shall notify the purchaser or purchaser's representative before proceeding

Note 1 to entry: The operation or process may proceed without witness if the purchaser does not attend after the agreed notice period.

3.5

surveillance

S

<conformity assessment> observation, monitoring or review by the purchaser or purchaser's representative of an activity, operation, process, product or associated information

3.6

review

R

<conformity assessment> review of the manufacturer's information to verify conformance to requirements

4 Symbols and abbreviations

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

CAS	conformity assessment system
IRS	information requirements specification
QMS	quality management system
QRS	quality requirements specification (this document)

5 Quality requirements

5.1 Quality management system

The manufacturer shall operate and maintain a quality management system (QMS) that conforms with ISO 9001, ISO 29001, API Specification Q1 or an equivalent quality management system standard.

5.2 Conformity assessment system (CAS)

5.2.1

The conformity assessment system (CAS) provides different levels of assessment of the manufacturer control activities. The CAS level is defined by the purchaser, using a risk-based approach, and included in the purchase order/contract. The defined CAS level may be adjusted by the purchaser during manufacture based on manufacturer performance and re-assessment of risk.

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

5.2.2

Quality plans and inspection and test plans shall include provision for purchaser intervention activities based on the CAS level selected in the procurement data sheet or purchase order. See Annex A.

5.2.3

Manufacturer performance in meeting the requirements may 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.

6 Certification and traceability

The manufacturer shall maintain traceability of sub-assembly components including, but not limited to, air circuit breakers, moulded case circuit breakers, intelligent electronic devices, busbars and bus duct, voltage transformers and current transformers to the original component manufacturer tag / serial number and where applicable, associated certification.

7 Evidence — conformance records

Documents and information shall be provided for 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.

	PURCHASER ASSESSMENT ACTIVITIES	CAS			
		A	B	C	D
1	Operational planning and control activities				
1.1	Quality planning	H	W	S	-
1.2	Inspection and test planning	H	H	W	R
1.3	Pre-assessment/inspection planning	H	W	S	-
2	Design and development activities				
2.1	Type testing (if type test certificates are not available) (IOGP S-560 10.10.1, 10.11.1, 5.2.4)	H	H	H	H
2.2	Strength of materials and parts, resistance to corrosion, thermal stability, resistance of insulating materials to abnormal heat and fire due to internal electric effects, resistance to ultraviolet (UV) radiation, lifting, protection against mechanical impact (IK code), marking (IOGP S-560 10.2.1)	R	R	-	-
2.3	Temperature rise, verification by testing, by comparison with a reference design or by assessment (calculation) (IOGP S-560 10.10.1)	R	R	-	-
2.4	Short-circuit withstand strength (IOGP S-560 10.11.1)	R	R	-	-
2.5	Arc fault tests (IOGP S-560 9.3.1)	R	R	-	-
2.6	Electromagnetic compatibility (EMC) (IOGP S-560 10.12)	R	R	-	-
3	Control of external supply				
3.1	External supply scope, risk assessment and controls	H	W	S	-
3.2	Nominated sub-suppliers of circuit breakers and protective devices	H	W	-	-
4	Production and service provision				
4.1	Materials verification				
4.1.1	Input material and components identification, traceability and certification (IOGP S-560 8.6.1, 8.5.3, 8.5.3.108.1, 8.5.3.109.1, 8.6.8.1)	S	S	S	-
4.2	Assembly routine verification				
4.2.1	Visual and dimensional checks (IOGP S-560 11.10)	H	W	S	-
4.2.2	Degree of protection against contact with hazardous live parts, ingress of solid foreign bodies and water of enclosures (IOGP S-560 8.2.2, 11.2, 8.103.1.3, 8.5.3.104.3, Table 18)	H	W	S	R
4.2.3	Clearances and creepage distances (IOGP S-560 5.2.4)	H	W	S	R
4.2.4	Protection against electric shock and integrity of protective circuits (IOGP S-560 8.4.2.3, 8.4.6.2.1, 11.4)	H	W	S	R

	PURCHASER ASSESSMENT ACTIVITIES <i>(continued)</i>	CAS			
		A	B	C	D
4.2.5	Incorporation of built-in components (IOGP S-560 11.5)	W	W	S	-
4.2.6	Internal electrical circuits and connections (IOGP S-560 11.6)	W	W	S	-
4.2.7	Terminals for external connections (IOGP S-560 11.7)	W	W	S	-
4.2.8	Mechanical operation (IOGP S-560 11.8, 6.2.2)	H	W	S	-
4.2.9	Dielectric properties (IOGP S-560 11.9)	H	W	S	R
4.2.10	Wiring, operational performance and function (IOGP S-560 11.10.1, 8.5.3.111.1, 8.5.3.111.2, 8.5.3.111.3)	H	W	S	R
4.3	Switchgear special tests (if included in scope as defined by the user in the data sheets)				
4.3.1	ECMS simulation test (IOGP S-560 11.101.2, 11.101.3)	H	W	S	R
5	Release of product or service				
5.1	Verify conformance to purchase order including as applicable				
5.1.1	Inspection of loose ship items, spares, special tools, as applicable	W	W	S	-
5.1.2	Handling, preservation and packaging (IOGP S-560 10.2.5.1, 6.2.2, 8.1.6)	W	W	S	-
5.2	Release equipment	H	H	H	H
Key H: Hold point W: Witness point R: Review S: Surveillance					

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