

REDLINE
Version 3.0 to Version 2.0

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

Redline Version

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.

ABOUT THE REDLINE VERSION

This Redline version aims at comparing Version 3.0 to Version 2.0 but may not capture all changes.

The Redline version is not a specification document. It is a mark-up copy provided for information only. The user must refer to the official published version.

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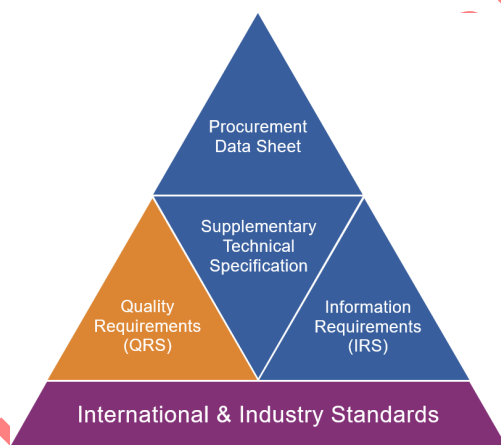
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Introduction

The purpose of this quality requirements for IEC 61439 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 packages in accordance with IOGP S-560 for application in the petroleum and natural gas industries.

Annex A defines the User conformance, verification and 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 requirements and inspection) activities;
- c) traceability requirements.

2 Normative references

The following documents are referenced in ~~one~~ IOGP S-560 and those listed below, in whole or more requirements in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the ~~version~~ cited applies. For undated references, the latest ~~version~~ 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 Industries, y

IOGP S-560, Supplementary Specification to IEC 61439-1 — Low voltage switchgear and controlgear assemblies — Part 1: General rules (Edition 2.0: 2011).

IEC 61439-2 for Low-voltage Switchgear and controlgear assemblies — Part 2: Power switchgear and controlgear assemblies (Edition 2.0: 2011). Controlgear

ISO 9001, Quality management systems — Requirements -

S-560 — Supplementary Requirements to IEC 61439-1 & 2 LV Switchgear & Controlgear.

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 ~~following~~ terms and definitions given in IOGP S-560 and ISO 9000 (normative to ISO 9001), and the following shall apply:

User

An associate 3.1
conformity assessment
demonstration that specified requirements are fulfilled

Note 1 to entry: Conformity assessment (or subsidiary 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 other organisation acting as owner, 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 customer as designated in the Purchase Order, 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** **Manufacturer**

Entity entering into a contract with Company/Principal to provide materials, goods, supplies, equipment, or plant and includes the successors and (or) permitted assigns of such entity.

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:

ECMS — Electrical control and monitoring CAS conformity assessment system

ITP — Inspection and test plan

PO — Purchase order

POQR — Purchase order quality IRS information requirements specification

SDR — Supplier deliverable QMS quality management system

QRS — quality requirements specification (this document)

SDRL — Supplier deliverable requirements list

5 Quality requirements

5.1 Quality management system

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

Conformance verification

- a. ~~ITP or other operational planning and control documents provided by Manufacturer shall define the specific controls to be implemented by Manufacturer to conform with S-560 and this PQQR.~~
- b. ~~Controls shall be applied to products and services provided by Manufacturer and sub-suppliers.~~
- c. ~~ITP or other operational planning and control documents, shall include the User.~~

Verification and 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.

- ~~1. surveillance requirements included in Annex A,~~
- ~~d. Conformance verification requirements in Annex A are minimum requirements, alternative requirement shall apply if specified in the Purchase Order.~~

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Annex A

User surveillance and inspection

		PURCHASER ASSESSMENT ACTIVITIES	CAS			
			A	REQUIREMENTS PRIOR TO MANUFACTURE / ASSEMBLY / TESTING	Activity Type	D
1		Post award kick-off and clarification meeting; <u>Operational planning and control activities</u>	H			
1.1		Approval of all key pre-manufacture deliverables in conformance to the SDRL Manufacture not to proceed until relevant deliverables are approved by User either with or without comments for inclusion, in accordance with the Quality Plan; <u>Quality planning</u>	H	<u>W</u>	<u>S</u>	<u>:</u>
1.2		<u>Inspection and test planning</u>	H	H	<u>W</u>	<u>R</u>
1.3		Pre-assessment/inspection meeting incorporating review of inspection and test plan; <u>planning</u>	H	<u>W</u>	<u>S</u>	<u>:</u>
2		<u>Design and development activities</u>				
2.1	REQUIREMENTS DURING MANUFACTURE / ASSEMBLY / TESTING	Activity Type <u>Type testing (if type test certificates are not available)</u> (IOGP S-560 10.10.1, 10.11.1, 5.2.4)	H	H	H	H
2.2		Switchgear performance tests (IEC 61439-1 / S-560 clause 9) where applicable <u>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</u> (IOGP S-560 10.2.1)	WR	R	:	:
2.3		Switchgear design <u>Temperature rise, verification</u> (IEC 61439-1 / by testing, by comparison with a reference design or by assessment (calculation)) (IOGP S-560 – clause 10 and all related sub-clauses) where applicable; <u>10.1</u>	WR	R	:	:
2.4		Switchgear routine verification tests (IEC 61439-1 / S-560 clause 11 and all related sub-clauses); <u>Short-circuit withstand strength</u> (IOGP S-560 10.11.1)	WR	R	:	:
2.5		Switchgear special <u>Arc fault tests</u> (IOGP S-560 – clause 11.101 ECMS) where applicable; <u>9.3.1</u>	WR	R	:	:
2.6		REQUIREMENTS FOR EQUIPMENT RELEASE AND PURCHASE ORDER COMPLETION <u>Electromagnetic compatibility (EMC)</u> (IOGP S-560 10.12)	Activity Type R	R	:	:

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3	Inspection of equipment preservation, sea-fastening, export packing and weighing of all items. Control of external supply	W			
3.1	Inspection of all loose ship items. External supply scope, risk assessment and controls	H	W	S	:
3.2	Inspection of insurance spares long term preservation and export packing. Nominated sub-suppliers of circuit breakers and protective devices	H	W	:	:
4	Verify all inspections and tests are complete, review evidence that all defect items are closed. Production and service provision	H			
4.1	Manufacturing record books. Materials verification	R			
4.1.1	Installation, operation and maintenance manual. 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)	RS	S	S	:
4.2	Assembly routine verification				
4.2.1	Despatch dossier(s). Visual and dimensional checks (IOGP S-560 11.10)	H	W	S	:
4.2.2	Certificate of conformity. 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	Final release (verification and acceptance of above requirements 1-9). 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

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Key:**Hold point (H)**

A critical operation or process beyond which work shall not proceed without attendance by User representative or written User approval.

Witness point (W)

An operation or process that requires witness by the User representative. The operation or process may proceed without witness only with prior User approval. Repetitive witnessing activities may be by percentage as specified.

Surveillance (S)

Periodic review by the User representative of an activity, operation, process or documentation at Manufacturers or sub-supplier premises. No specific notification is required and the activity, operation or process may proceed if the User representative is not present.

Review (R)

User

~~review of Manufacturer documentation providing objective evidence of the Manufacturer's conformance to the Purchase Order requirements. Documentation to be submitted to User office as stated in SDRL.~~

	PURCHASER ASSESSMENT ACTIVITIES <i>(continued)</i>	CAS			
		A	B	C	D
4.2.5	Incorporation of built-in components (IOGP S-560 11.5)	<u>W</u>	<u>W</u>	<u>S</u>	-
4.2.6	Internal electrical circuits and connections (IOGP S-560 11.6)	<u>W</u>	<u>W</u>	<u>S</u>	-
4.2.7	Terminals for external connections (IOGP S-560 11.7)	<u>W</u>	<u>W</u>	<u>S</u>	-
4.2.8	Mechanical operation (IOGP S-560 11.8, 6.2.2)	H	<u>W</u>	<u>S</u>	-
4.2.9	Dielectric properties (IOGP S-560 11.9)	H	<u>W</u>	<u>S</u>	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	<u>W</u>	<u>S</u>	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	<u>W</u>	<u>S</u>	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	<u>W</u>	<u>W</u>	<u>S</u>	-
5.1.2	Handling, preservation and packaging (IOGP S-560 10.2.5.1, 6.2.2, 8.1.6)	<u>W</u>	<u>W</u>	<u>S</u>	-
5.2	Release equipment	H	H	H	H
Key H: Hold point W: Witness point R: Review S: Surveillance					

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