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Producers

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IOGP S-620

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**REDLINE**

Version 2.0 to Version 1.0

# Quality Requirements for High-voltage Switchgear and Controlgear (IEC)

Redline Version

## Revision history

VERSION	DATE	PURPOSE
2.0	December 2022	Second Edition
1.0	October 2018	First Edition

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## 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 second edition cancels and replaces the first edition published in October 2018.

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

### ABOUT THE REDLINE VERSION

**This Redline version aims at comparing Version 2.0 to Version 1.0 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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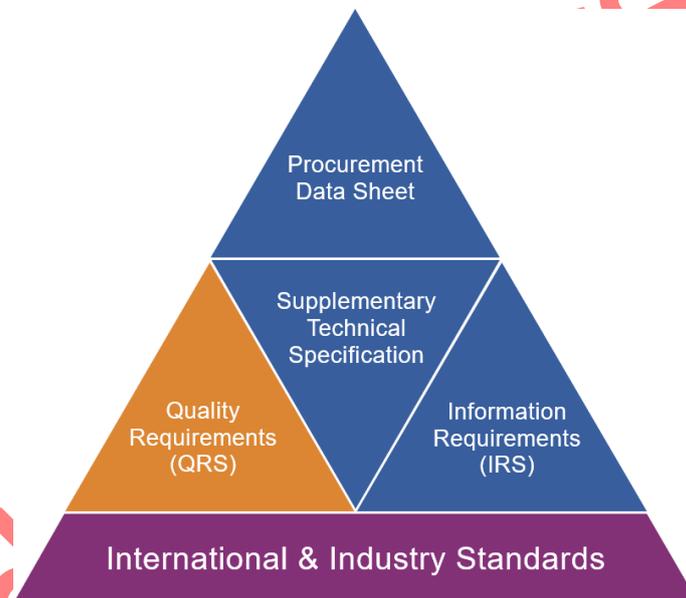
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## Introduction

The purpose of this quality requirements specification (QRS) is to ~~define~~specify quality management requirements and the proposed extent of purchaser intervention activities for the supply procurement 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 Purchaser intervention activities are identified through the selection of one of four conformity assessment system (CAS) which specifies standardized user interventions against quality management activities at four different levels.~~ based on a risk and criticality assessment. The applicable CAS level is specified by the purchaser in the ~~equipment datasheet~~procurement data sheet or purchase order.

This QRS shall be used in conjunction with the ~~supplementary requirements~~ specification (IOGP S-620), the procurement data sheet (IOGP S-620D) and 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**

## 1 Scope

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

- a) ~~manufacturer~~supplier 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-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 for High-voltage ~~s~~Switchgear and controlgear*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-620 and 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 ~~C~~

#### conformity assessment

~~D~~demonstration that specified requirements ~~relating to a product, service, process, system, person or body~~ are fulfilled.

#### NOTE

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

#### NOTE

Note 2 to entry: 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** ~~C~~**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 system that provides different levels of purchaser interventions to assess and verify supplier conformance to specified requirements~~

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

**3.3**~~Conformity assessment~~ **hold point**~~Point~~ **H**

~~<conformity assessment> point in the chain of activities beyond which an activity shall not proceed without the approval of the user / user's purchaser or purchaser's representative.~~

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### 3.4

~~Conformity assessment~~—witness point

Point **W**

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

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

### 3.5

~~Conformity assessment~~—surveillance

Observation **S**

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

### 3.6

~~Conformity~~  
review

**R**

~~<conformity assessment—>~~ review

~~Review~~ of the ~~manufacturer's~~supplier's information by the ~~user / user's representative to determine~~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

For purposes of this document, the following ~~abbreviation applies:~~symbols and abbreviations apply.

CAS      ~~€~~ conformity assessment system

IRS      ~~†~~ information requirements specification

QMS      quality management system

QRS      ~~Q~~ quality requirements specification (this document)

## 5 Quality requirements

### 5.1 Quality management system

The manufacturer shall ~~demonstrate~~operate and maintain a quality management system (QMS) that ~~the quality management arrangements established for the supply of products and/or services conform to~~conforms with ISO 9001, ISO 29001, API Specification Q1 or an equivalent quality management system standard~~—agreed with the user.~~

### 5.2 Conformanceity assessment system (CAS)

#### 5.2.1

The conformity assessment system (CAS) provides different levels of assessment of the supplier 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 supplier 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 ~~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 purchaser intervention activities based on the user CAS; see Annex A, as specified level selected in the procurement data sheet or purchase order. See Annex A.~~

### **Manufacturer** 5.2.3

~~Supplier performance in meeting the requirements will~~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.

~~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**

### 6 Certification and traceability

The manufacturer shall maintain traceability of sub-assembly components including, but not limited to, ~~high-voltage switches, high-voltage gas insulated switchgear, air insulated switchgear, moulded case circuit breakers, high voltage contactors, intelligent electronic devices (IEDs), busbars and 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~~Documents and information shall be provided for in accordance with the associated IRS.

## Annex A (normative)

### User 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 Clause 5.~~

	<u>PURCHASER</u> ASSESSMENT ACTIVITIES	CAS			
		A	B	C	D
<b>1</b>	<b>Operational planning and control activities</b>				
1.1	Quality <del>Plan (ISO 9001, 8.1 and ISO 10005)</del> <u>planning</u>	H	<del>H</del> <u>W</u>	<del>S</del> <u>S</u>	-
1.2	Inspection and <del>Test Plan (ISO 9001, 8.1 and ISO 10005)</del> <u>test planning</u>	H	H	<del>H</del> <u>W</u>	<del>R</del> <u>R</u>
1.3	Pre-assessment/inspection planning	H	W	W	-
<b>2</b>	<b>Design and development activities</b>				
2.1	<del>Declaration of conformity to the prototype of switchgear type tests (IOGP S-620, Clause 6) and all related clauses where applicable. Type testing (if type test certificates are not available)</del>	H	<del>R</del> <u>H</u>	<del>R</del> <u>H</u>	<del>R</del> <u>H</u>
<b>3</b>	<b>Control of external supply</b>				
3.1	<u>External supply scope, risk assessment and controls</u>	<del>H</del> <u>H</u>	<del>W</del> <u>W</u>	<del>S</del> <u>S</u>	-
3.1.2	<del>Control of externally provided processes, products and services (ISO 9001, 8.4)</del> <u>Nominated sub-suppliers of circuit breakers and protective devices</u>	H	<del>R</del> <u>W</u>	<del>R</del> <u>R</u>	-
<b>4</b>	<b>Production and service provision</b>				
4.1	Materials verification				
4.1.1	Input material and components identification, traceability and certification (IOGP S-620 5.5, 6.3.102, E.4.1.3)	S	S	S	-
4.2	Assembly routine <del>verification (IOGP S-620, Clause 7)</del> <u>tests</u>				
4.2.1	Dielectric test on the main circuit (IEC 62271-1, (IOGP S-620 8.1 and IEC 62271-200, 7.1)2)	<del>W</del> <u>H</u>	<del>S</del> <u>W</u>	S	<del>R</del> <u>R</u>
4.2.2	Test on auxiliary and control circuits (IEC 62271-1, (IOGP S-620 8.3.1, 8.3 and IEC 62271-200, 7.2)	<del>W</del> <u>H</u>	<del>S</del> <u>W</u>	S	-
4.2.3	Measurement of the resistance of the main circuits (IEC 62271-1, (IOGP S-620 8.4 and IEC 62271-200, 7.3))	W	<del>S</del> <u>W</u>	S	-
4.2.4	Tightness test (IEC 62271-1, 8.5 and IEC 62271-200, 7.4) <del>;</del> applicable to gas/liquid-filled assemblies only; (IOGP S-620 8.5)	W	<del>S</del> <u>W</u>	S	-
4.2.5	Design and visual checks (IOGP S-620, <del>7.5</del> 8.102, 8.6.1, 8.6.2, 8.6.3, 8.6.4)	<del>W</del> <u>H</u>	<del>S</del> <u>W</u>	S	-
4.2.6	Mechanical operation test (IEC 62271-200, <del>7</del> (IOGP S-620 8.102)	<del>W</del> <u>H</u>	<del>S</del> <u>W</u>	S	-
4.2.7	Pressure tests of gas compartments (IEC 62271-200, 7.103) <del>;</del> applicable to gas filled assemblies only; (IOGP S-620 8.103)	W	<del>S</del> <u>W</u>	<del>S</del> <u>R</u>	<del>R</del> <u>R</u>

	<b>PURCHASER ASSESSMENT ACTIVITIES</b>	<b>CAS</b>			
		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
4.2.8	<del>Tests of auxiliary electrical, pneumatic and hydraulic devices (IEC 62271-200, 7.104)</del>	<del>W</del>	<del>S</del>	<del>S</del>	
4.3	Switchgear special tests (IOGP S-620, Clause 7) <del>(if included in scope as defined by the user in the data sheets)</del> (IOGP S-620, Clause 7)				
4.3.1	<del>Artificial pollution tests for outdoor insulators (IOGP S-620, 6.2.8)</del>	<del>W</del>	<del>W</del>	<del>S</del>	
4.3.2.1	Partial discharge measurement (IEC 62271-1, 7 (IOGP S-620 8.101)	<del>W</del> <u>H</u>	<del>W</del>	<del>S</del>	<del>-</del>
4.3.3.2	ECMS simulation test (IOGP S-620, 7.107)	<del>H</del>	<del>W</del>	<del>S</del>	<del>-</del>
<b>5</b>	<b>Release of product or service</b>				
5.1	Verify conformance to <del>PO</del> <u>purchase order</u> including as applicable				
5.1.1	<del>Weight</del>	<del>R</del>	<del>R</del>	<del>R</del>	
5.1.2.1	<del>Loose</del> <u>Inspection of loose</u> ship item, spares special tools as applicable (IOGP S-620 11.6.1, 11.6.3, E.4.1.1)	<del>W</del>	<del>W</del>	<del>S</del>	<del>-</del>
5.1.3.2	Handling, preservation and packaging	<del>W</del>	<del>W</del>	<del>S</del>	<del>-</del>
5.1.4	<del>Final information review; as per IOGP S-620L</del>	<del>H</del>	<del>H</del>	<del>R</del>	<del>R</del>
5.2	Release equipment	<del>H</del>	<del>W</del> <u>H</u>	<del>W</del> <u>H</u>	<del>S</del> <u>H</u>
<b>6</b>	<del>Final inspection and testing</del> <i>[if included in scope as defined by the user in the purchase order]</i>				
6.1	<del>Tests after erection on site</del> (IEC 62271-1, 11.3.7 and IEC 62271-200, 7.105)	<del>W</del>	<del>W</del>	<del>W</del>	<del>S</del>
6.2	<del>Measurement of fluid condition after filling on site</del> (IEC 62271-200, 7.106) <i>[applicable to gas/liquid-filled assemblies only]</i>	<del>W</del>	<del>W</del>	<del>W</del>	<del>S</del>
<p><b>NOTE 1 — Key</b>  <del>H is hold:</del> <u>Hold</u> point  <del>W is witness:</del> <u>Witness</u> point  <u>R:</u> <u>Review</u>  <del>S is surveillance and R is review.</del></p> <p><b>NOTE 2</b> Definitions for these terms are provided in Clause 3.: <u>Surveillance</u></p>					

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