

REDLINE
Version 2.0 to Version 1.0

Quality Requirements for AC Uninterruptible Power Supply (UPS) System and Associated Batteries (PIP)

Redline Version

Revision history

VERSION	DATE	PURPOSE
2.0	March 2024	Second Edition
1.0	November 2020	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 second edition cancels and replaces the first edition published in November 2020.

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 (from Clause 1 onwards) 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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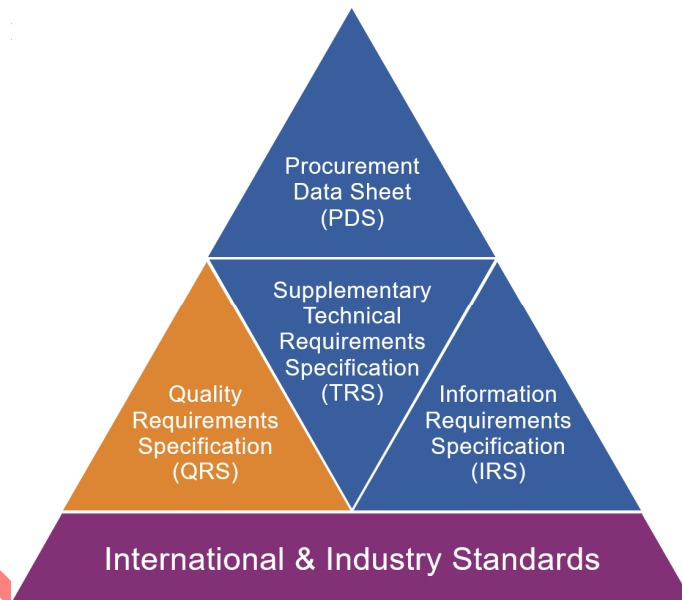
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Introduction

The purpose of this quality requirements specification (QRS) is to specify quality management requirements and the proposed extent of purchaser intervention activities for the procurement of AC uninterruptible power supply (UPS) systems and associated batteries in accordance with IOGP S-734 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-734), the procurement data sheet (IOGP S-734D) and the information requirements specification (IOGP S-734L) 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 (QRS)

1 Scope

To specify quality management requirements for the supply of AC uninterruptible power supply (UPS) systems to IOGP S-734 including:

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

~~d) evidence of conformance;~~

~~e) factory acceptance.~~

2 Normative references

For the purpose of this document, the documents referenced in IOGP S-734 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*

~~IEC 62040-3, *Uninterruptible power systems (UPS) — Part 3: Method of specifying the performance and test requirements*~~

IOGP S-734, *Supplementary Specification to PIP ELSAP04 for AC Uninterruptible Power Supply (UPS) System and Associated Batteries*

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-734, and ISO 9000 (normative to ISO 9001), and the following shall apply.

~~3.1~~ **conformity assessment**

~~Demonstration that specified requirements relating to a product, 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/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 system that provides 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, interventions to conform to the product or service specification, assess and obligatory verify supplier conformance to specified requirements.~~

~~NOTE~~ ~~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~~hold point

~~(H)~~

~~Point~~<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 ~~Conformity assessment – W~~witness point

~~(W)~~

~~<conformity assessment>~~ Point in the chain of activities that the supplier 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 ~~Conformity assessment – S~~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 ~~Conformity assessment – R~~review

~~(R)~~

~~<conformity assessment>~~ Revue of the supplier's information to verify conformance to requirements.

~~NOTE~~ ~~Information requirements are managed on a 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 symbols and abbreviations apply:

CAS conformity assessment system

IRS information requirements specification

PDS procurement data sheet

QMS quality management system

QRS quality requirements specification (this document)

~~UPS uninterruptible power supply~~

5 Quality requirements

5.1 Quality management system

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

5.2 **Conformance** ~~assessment~~ system (CAS)

5.2.1

~~Quality plans and inspection and test plans developed as outputs to operational planning and control shall define the specific controls to be implemented by the supplier to ensure conformance with the specified requirements.~~

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

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

5.2.3

~~Quality, inspection 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~~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 proven solutions CAS level D is specified unless risk assessment indicates that a more stringent CAS level is required.~~

~~NOTE 2 The supplier remains responsible for operational planning and control and demonstration of the conformity of products and services with the requirements irrespective of the conformity assessment requirements defined by the purchaser. See ISO 9001, 8.1 and 8.2.~~

6 **Certification and traceability**

~~The manufacturer/supplier shall maintain traceability of sub-assembly and major components to the original component manufacturer/supplier tag / serial number and where applicable, associated Material certification. See ISO 9001, 8.5.2.~~

7 **Control of nonconforming products and services**

~~Nonconformance with specified requirements identified by or to the supplier and traceability shall be corrected such that the specified requirements are satisfied or the purchaser's acceptance of the nonconformance agreed maintained in accordance with purchase order conditions. See ISO 9001, 8.2.3, 8.2.4, 8.5.6 and 8.7 PIP ELSAP04 and IOGP S-734.~~

87 Evidence (~~conformance records~~)

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

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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 (IOGP S-734, 4.20.1, 4.20.10, 4.20.11, 4.20.12, 4.20.9)	H	W	S	-
1.2	Inspection and test planning (IOGP S-734, 4.20.1)	H	H	WR	WR
1.3	Pre-Attend pre-inspection, pre-production planning (meeting) (IOGP S-734, 4.20.1, 4.20.10, 4.20.11, 4.20.12, 4.20.9)	H	H	W	S
2	Design and development activities				
2.1	Calculations (UPS sizing, battery capacity, back-up time and short-circuit) (IOGP S-734, 4.13.2)	H	H	W	W
2.2	Verification of the design performance characteristics (PIP EL SAP04, Table 1) (IOGP S-734, Table 1)	H	H	R	R
2.3	Verification of equipment layout design (general arrangements) (IOGP S-734, 4.22.3)	H	H	W	R
2.4	Verification of equipment functional design (wiring and interface schematics) (IOGP S-734, 4.22.3)	H	H	W	W
2.5	Verification of component selection (bill of materials) (IOGP S-734, 4.1.4, 4.22.3)	W	W	R	R
2.6	Review of Type tests as per IEC 62040-3:2021, 6.4, 6.5 and Table 5. Type tests may be performed if type test certificates (certifications) are not available for review. (IOGP S-734, 4.2.6, 4.20.2, 4.20.3)	H	WH	RH	RH
3	Control of external supply				
3.1	External supply scope, risk assessment and controls	H	W	R	-
3.2	Nominated sub-suppliers of sub-assemblies, components and accessories	H	W	R	-
3.3	Nominated supplier/sub-supplier of batteries	H	W	W	R
4	Production and service provision				
4.1	Verification of incoming materials (type, condition, quantity and certification)	W	S	S	-
4.2	Verification of factory instrument calibration	W	S	S	-
4.3	Verification of assembly (including review of in-process records)	W	S	S	-
4.4	Routine and special testing				
4.4.1	Visual/dimension check (IEC 62040-3, 6.2.2.2, IEC 60146-2, 7.3.1) <u>Verification of incoming materials (e.g., type, condition, quantity and certification)</u> (IOGP S-734, 4.1.20.1, 4.20.1.24, 4.1.4.20, 4.13.3, 4.15.1, 4.15.2, 4.15.3, 4.15.4, 4.15.5, 4.15.6, 4.16.1, 4.16.2, 4.16.3)	HW	WS	S	-
4.4.2	Painting inspection (IEC 60146-2, 7.3.1) <u>Verification of assembly, including review of process records</u> (IOGP S-734, 4.1.4, 4.19.3, 4.19.4, 4.19.5, 4.19.6, 4.19.7, 4.20.4)9)	W	S	S	-
4.4.3	Grounding test (IEC 60146-1-1, 7.2.2) <u>Verification of equipment layout design (e.g., general arrangement drawing)</u> (IOGP S-734, 4.20.22.1)	WH	RH	SW	-R

4.4	<u>Routine testing</u>				
4.4.4.1	Full rated capacity burn-in test (Routine testing as specified on data sheet) (per IEC 60146-1-1, 7.6.2.2.1, 7.6.2.2.2, 7.6.2.2.3, 7.6.2.2.4, 7.6.2.2.5, 7.6.2.2.6, 7.6.2.2.7, 7.6.2.2.8, 7.6.2.2.9, 7.6.2.2.10, 7.6.2.2.11, 7.6.2.2.12, 7.6.2.2.13, 7.6.2.2.14, 7.6.2.2.15, 7.6.2.2.16, 7.6.2.2.17, 7.6.2.2.18, 7.6.2.2.19, 7.6.2.2.20, 7.6.2.2.21, 7.6.2.2.22, 7.6.2.2.23, 7.6.2.2.24, 7.6.2.2.25, 7.6.2.2.26, 7.6.2.2.27, 7.6.2.2.28, 7.6.2.2.29, 7.6.2.2.30, 7.6.2.2.31, 7.6.2.2.32, 7.6.2.2.33, 7.6.2.2.34, 7.6.2.2.35, 7.6.2.2.36, 7.6.2.2.37, 7.6.2.2.38, 7.6.2.2.39, 7.6.2.2.40, 7.6.2.2.41, 7.6.2.2.42, 7.6.2.2.43, 7.6.2.2.44, 7.6.2.2.45, 7.6.2.2.46, 7.6.2.2.47, 7.6.2.2.48, 7.6.2.2.49, 7.6.2.2.50, 7.6.2.2.51, 7.6.2.2.52, 7.6.2.2.53, 7.6.2.2.54, 7.6.2.2.55, 7.6.2.2.56, 7.6.2.2.57, 7.6.2.2.58, 7.6.2.2.59, 7.6.2.2.60, 7.6.2.2.61, 7.6.2.2.62, 7.6.2.2.63, 7.6.2.2.64, 7.6.2.2.65, 7.6.2.2.66, 7.6.2.2.67, 7.6.2.2.68, 7.6.2.2.69, 7.6.2.2.70, 7.6.2.2.71, 7.6.2.2.72, 7.6.2.2.73, 7.6.2.2.74, 7.6.2.2.75, 7.6.2.2.76, 7.6.2.2.77, 7.6.2.2.78, 7.6.2.2.79, 7.6.2.2.80, 7.6.2.2.81, 7.6.2.2.82, 7.6.2.2.83, 7.6.2.2.84, 7.6.2.2.85, 7.6.2.2.86, 7.6.2.2.87, 7.6.2.2.88, 7.6.2.2.89, 7.6.2.2.90, 7.6.2.2.91, 7.6.2.2.92, 7.6.2.2.93, 7.6.2.2.94, 7.6.2.2.95, 7.6.2.2.96, 7.6.2.2.97, 7.6.2.2.98, 7.6.2.2.99, 7.6.2.2.100) (IOGP S-734, 4.20.1, 4.20.69)	WH	WH	RW	RW
4.5	<u>Additional tests</u>				
4.4.5.1	Insulation resistance measurement Full rated capacity burn-in test (IEC 62040-3, 6.2.2.1, IEC 60146-1-1, 7.2.3) : if any component fails during this test, the component is to be replaced and the test restarted from time zero. (IOGP S-734, 4.20.10)	HW	WS	R	R
4.4.6.5.2	Applied voltage test (IEC 62040-3, 6.2.2.1, IEC 60146-1-1, 7.2.2) Verification of communications indicated in the PDS Verification of correct interface(s) as selected in the PDS Verification of functionality of the selected interface(s) (IOGP S-734, 4.18.7.2, 4.20.11)	H	WH	R	R
4.5	<u>Functional testing</u>				
4.5.1	Functional test - light load (IEC 62040-3, 6.2.2.3) (IOGP S-734, 4.20.1)	H	W	W	R
4.5.2	Synchronization and frequency slow rate (IEC 62040-3, 6.2.2.6) (IOGP S-734, 4.20.1)	W	W	R	S
4.5.3	Load transfer test (Equal load sharing of duplicate (paralleled) UPS systems in addition to IEC 62040-3:2021, 6.2.4.2.6, 6.2.2.7, 6.2.2.8, 6.2.2.9) (IOGP S-734, 4.20.1, 4.20.612)	H	H	W	RW
4.5.4	Auxiliary equipment and control circuit tests - no load (IEC 62040-3, 6.2.2.4) (IOGP S-734, 4.20.1, 4.20.6) Charger float/equalize functionality (IOGP S-734, 4.6.2)	WH	WH	RW	S
4.5.5	Verify communications (IOGP S-734, 4.20.6.12)	H	W	W	R
4.5.6	Verify load sharing for parallel and redundant UPS systems (IOGP S-734, 4.20.7)	H	W	W	R
4.6	<u>Full load testing</u>				
4.6.1	Full load test (IEC 62040-3, 6.2.2.5) (IOGP S-734, 4.20.1, 4.20.6)	H	H	W	W
4.6.2	Rectifier charger voltage regulation and current limit test (IOGP S-734, 4.20.6)	W	W	R	S
4.6.3	Inverter output voltage regulation and phase and balance (IOGP S-734, 4.20.6)	W	W	R	S
4.6.4	Dynamic performance test (IEC 62040-3, 6.4.3.3) (IOGP S-734, 4.20.1)	W	W	R	R
4.6.5	DC ripple measurement (IEC 62040-3, 6.4.4.3, IEC 60146-1-1, 7.3.5) (IOGP S-734, 4.20.1, 4.20.6)	W	W	R	S
4.6.6	Overload test (IEC 62040-3, 6.4.2.10.1, 6.4.2.10.2) (IOGP S-734, 4.20.1)	H	H	W	R
5	Release of product				
5.1	Verify Verification of conformance to purchase order	H	W	R	R
5.2.1.1	Handling, packing, preservation and storage (IOGP S-734, 4.21.1, 4.21.3, 4.21.4, 4.21.5, 4.21.8, 4.21.9)	W	W	R	R
5.3	Review of final documentation per IOGP S-734L	W	R	R	R
5.4	Release equipment	H	H	W	W
6	Integration testing				
6.5.1.2	Site test (IEC 62040-3, 6.1.3, 6.3)	HW	HW	WS	W

	<u>Inspection of loose ship items, spares and special tools, as applicable</u> (IOGP S-734, 4.20.1, 4.20.2, 4.20.11)				
6.25.1.3	<u>Battery capacity test (as specified on data sheet)</u> <u>Release of equipment</u> (IOGP S-734, 4.20.1, 4.20.2, 4.20.10, 4.20.11, 4.20.12, 4.20.9)	H	H	WH	WH
<u>Key</u> H is hold: <u>Hold</u> point W is witness: <u>Witness</u> point; R: <u>Review</u> S is surveillance and R is review. NOTE Definitions for these terms are provided in Section 3: <u>Surveillance</u>					

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