

Quality Requirements for Water Mist Fire Protection Systems

Revision history

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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 2014).

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Introduction

The purpose of this quality requirements specification (QRS) is to define quality management requirements for the procurement of water mist fire protection systems in accordance with IOGP S-719 for application in the petroleum and natural gas industries.

The QRS includes definition of a conformity assessment system (CAS) which specifies standardized customer interventions against quality management activities at four different levels. The applicable CAS level is specified by the customer in the equipment data sheet or purchase order.

This QRS shall be used in conjunction with the supplementary requirements specification IOGP S-719, the information requirements specification IOGP S-719L and the equipment data sheet IOGP S-719D 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 water mist fire protection systems to IOGP S-719 Supplementary Specification to NFPA 750 Water Mist Fire Protection Systems, including:

- a) supplier quality management system requirements;
- b) customer conformity assessment (surveillance and inspection) activities;
- c) traceability requirements;
- d) evidence of conformance;
- e) factory acceptance testing (FAT);
- f) installation and commissioning.

2 Normative references

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*

NFPA 750, *Standard on Water Mist Fire Protection Systems*

IOGP S-719, *Supplementary Specification to NFPA 750 Water Mist Fire Protection Systems*

IOGP S-715, *Supplementary Specification for painting and coating*

IOGP S-716, *Supplementary Specification for instrument tubing and fittings*

IOGP S-718, *Supplementary Specification to API RP 551 Process Measurement*

For the purpose of this document, the documents referenced in S-719 and those listed above, 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.

3 Terms and definitions

For the purpose of this document, the terms and definitions given in NFPA 750, IOGP S-719, ISO 9000 (normative to ISO 9001) and the following shall apply.

3.1 Conformity assessment

Demonstration that requirements relating to a product, process, system, person or body are fulfilled.

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

NOTE 2 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 different levels of assessment of the supplier's control activities by the customer (second party) or independent body (third party) based on evaluation of the supplier's capability to conform to the product or service specification.

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

3.3 Conformity assessment - Hold point (H)

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

3.4 Conformity assessment - Witness point (W)

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

3.5 Conformity assessment - Surveillance (S)

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

3.6 Conformity assessment - Review (R)

Review of the supplier's information 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.

3.7 Critical

That deemed by the organization, product specification, or customer as mandatory, indispensable or essential, needed for a stated purpose or task, and requiring specific action.

4 Symbols and abbreviations

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

| | |
|-----|--|
| CAS | Conformity assessment system |
| IRS | Information requirements specification |
| QRS | Quality requirements specification (this document) |
| FFS | Fire fighting skid |

5 Quality requirements

5.1 Quality management system

The supplier shall demonstrate that the quality management arrangements established for the supply of products and services conform to ISO 9001, API Specification Q1 or an equivalent quality management system.

5.2 Conformance assessment

5.2.1

Quality and inspection plans 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 supplier and when applicable, their sub-suppliers, to ensure conformance with the specified requirements.

5.2.2

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

5.2.3

Quality plans and inspection and test plans shall include provision for the customer conformity assessment system (CAS) as specified in the data sheet. See Annex A.

5.2.4

Supplier 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 proven solutions CAS level D is specified unless risk assessment indicates that a more stringent CAS level is required.

NOTE 2 Irrespective of conformity assessment requirements defined by the customer, either, by reference to standard or specification requirements or in the scope, the supplier remains responsible for operational planning and control and demonstration of the conformity of products and services with the requirements. See ISO 9001, 8.1 and 8.2.

6 Traceability

Material certification and traceability shall be maintained in accordance with Annex B.

7 Control of nonconforming products and services

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

8 Evidence (records)

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

Annex A (normative)

Customer conformity assessment requirements

This annex defines four conformity assessment systems (CAS) or levels of customer assessment. The supplier shall provide for the specified CAS when developing quality plans and inspection and test plans in accordance with Clause 5.

| | CUSTOMER ASSESSMENT ACTIVITIES | CAS | | | |
|----------|--|-----|---|---|---|
| | | A | B | C | D |
| 1 | Operational planning and control activities | | | | |
| 1.1 | Quality planning (ISO 9001, 8.1 and ISO 10005) | H | W | R | - |
| 1.2 | Inspection and testing planning (ISO 9001, 8.1 and ISO 10005) | H | W | R | - |
| 1.3 | Pre-assessment/inspection planning | H | W | S | - |
| 2 | Design and development activities | | | | |
| 2.1 | Design documentation review (datasheet, P&ID, G/A) | H | H | W | R |
| 2.2 | Fire test certificate/approval report (listed system) 13.4.6, 16.1.2.1, 16.3, 17.1, 17.2, 17.4.1, 17.5.2, 5.2.2 | H | W | R | R |
| 2.3 | Fire scenario engineered solutions only 13.4.6, 16.3.2, 17.1.4, 17.1.7, 17.2, 17.5.2, 9.1.5 | H | H | H | H |
| 2.4 | Manufacturing procedure qualification tests | | | | |
| 2.4.1 | Procedure qualification for welding, including repair welding, of pressure-containing parts and attachment welding to pressure-containing parts. | H | W | R | - |
| 2.4.2 | Procedure qualification for welding, including repair welding, of structural welds. | H | W | R | - |
| 2.4.3 | Welder performance qualification | H | R | - | - |
| 2.4.4 | Non-destructive testing process and personnel qualification. | H | R | - | - |
| 3 | Control of external supply | | | | |
| 3.1 | Control of externally provided processes, products and services (ISO 9001, 8.4) | R | R | - | - |
| 3.2 | List of nominated sub-suppliers of primary system components as per the system listing. | H | R | - | - |
| 4 | Production and service provision | | | | |
| 4.1 | Material certification and traceability for primary pressure-containing components 17.1.4.4 | R | R | - | - |
| 4.2 | Component manufacture | | | | |
| 4.2.1 | Testing (as applicable) of nozzles 17.1.4.4, 17.2.4.3 | R | - | - | - |
| 4.2.2 | Testing (as applicable) of flexible hoses 17.1.4.4 | R | - | - | - |
| 4.2.3 | Testing (as applicable) of cylinders 17.1.4.4 | R | - | - | - |
| 4.2.4 | Testing (as applicable) of FFS/enclosure 17.1.4.4 | R | - | - | - |
| 4.3 | Sub-assembly manufacture | | | | |
| 4.3.1 | Testing (as applicable) of section control valves 17.1.4.4 | R | - | - | - |

| | | | | | |
|--|--|---|---|---|---|
| 4.3.2 | Testing (as applicable) of pumps/ manifolds/cylinder assembly 17.1.4.4 | R | - | - | - |
| 4.4 | Water mist system FAT | | | | |
| 4.4.1 | Mechanical assembly test 12.5.2.4, 17.1.4.4, 17.2.4.3, 6.2, 6.9.1.5, 8.8.3.2 | H | W | R | R |
| 4.4.2 | Electrical assembly test (installation, insulation and continuity) 17.1.4.4 | H | W | R | R |
| 4.4.3 | Discharge test (optional) 14.2, 17.2.4.3 | H | W | R | - |
| 5 | Release of product or service from suppliers/manufacturers works | | | | |
| 5.1 | Documentation review; as per IRS (S-719L) 17.18, 17.19, 17.2 | H | H | H | H |
| 5.2 | Preparation for handling, packing, preservation and storage 17.7.9, 8.5.5.2 | H | H | - | - |
| 5.3 | Spare parts and special tools check 5.1.3 | H | H | S | S |
| 5.4 | Final inspection 17.11, 17.19.1 | H | H | W | W |
| 5.5 | Release equipment | H | H | H | H |
| 6 | Water mist system commissioning & site acceptance test (SAT) when performed by the supplier | | | | |
| 6.1 | Pneumatic test 14.1, 14.2, 17.19 | R | R | R | R |
| 6.2 | Hydrostatic test 14.1, 14.2, 8.3.2 | W | W | W | W |
| 6.3 | Electrical detection and actuation test 12.6.2.2, 14.1, 14.2, 16.1, 16.2.9, 16.3, 17.6 6.10, 6.9, 7.2.1.3, 8.6.3, 8.8, 8.9, FIGURE A.14.1.4 | W | W | W | W |
| 6.4 | Mechanical equipment inspection and testing 12.5, 12.6, 13.4.4, 14.1, 14.2, 16.1, 16.2, 16.3, 16.4, 17.1.8, 17.17, 6.10, 6.3, 6.4, 6.5, 6.6, 6.7, 6.9, 7.2.1.3, 7.4, 8.1, 8.10, 8.2, 8.3, 8.5, 8.6, 8.8, 8.9, FIGURE A.14.1.4, Table 8.3.4.2 | W | W | W | W |
| 6.5 | Water supply inspection 12.1.2, 12.4, 12.5, 12.6, 12.7, 14.1, 14.2, 17.5.2, 8.7.2, 8.8.4.2 | W | W | W | W |
| 7 | Release of water mist system for service | | | | |
| 7.1 | Final documentation review as per IRS (S-719L) 13.4.6, 17.18 | H | H | H | H |
| 7.2 | Release of system for service 14.1, 14.2.7 | H | H | H | H |
| H is hold point, W is witness point, S is surveillance and R is review. Note: Definitions for these terms are provided in Section 3 of this document. | | | | | |

Annex B (normative)

Material traceability and certification requirements

| Item | | Certificate Type | Traceability level | Additional Requirements |
|--|---|------------------|--------------------|-------------------------|
| Water Mist Fire Protection Systems | Primary pressurized components: cylinder, pressurized tanks, manifold, flexible hoses | 2.1 | Level II | |
| | Tubing & fittings and instruments (including Ex rated components) | 2.1 | Level II | |
| | Fire fighting skid enclosure | 2.1 | Level II | |
| | Nozzles, section control valves, pumps | 2.2 | Level II | |
| Explanatory notes Inspection Certificates shall be provided in accordance with ISO 10474 or EN 10204. Traceability A. Level I - Full Traceability - Material is uniquely identified and its history tracked from manufacture through stockists (where applicable) to the supplier and to actual position on the equipment with specific location defined on a material placement record (the traceability to a specific location only applies to skids / packaged equipment, not to bulks). B. Level II - Type Traceability - The supplier maintains a system to identify material throughout manufacture, with traceability to a material certificate. C. Level III - Compliance Traceability - The supplier maintains a system of traceability that enables a declaration of compliance to be issued by the supplier. | | | | |

Registered Office

City Tower
40 Basinghall Street
14th Floor
London EC2V 5DE
United Kingdom

T +44 (0)20 3763 9700
F +44 (0)20 3763 9701
reception@iogp.org

Brussels Office

Bd du Souverain,165
4th Floor
B-1160 Brussels
Belgium

T +32 (0)2 566 9150
F +32 (0)2 566 9159
reception@iogp.org

Houston Office

10777 Westheimer Road
Suite 1100
Houston, Texas 77042
United States

T +1 (713) 470 0315
reception@iogp.org

| www.iogp.org

