International Association of Oil & Gas Producers

SPECIFICATION
IOGP S-719J

May 2024
Version 1.1

# Supplementary Specification to NFPA 750 for Water Mist Fire Protection Systems

**NOTE This version (S-719J) of the specification document provides the justification statements for each technical requirement, but is otherwise identical in content to S-719.**



JIP33
JOINT INDUSTRY PROGRAMME

**Revision history**

| VERSION | DATE | PURPOSE |
|---|---|---|
| 1.1 | May 2024 | Issued for Public Review |
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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).

### Disclaimer



### Copyright notice

# 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).

# Table of Contents

# Introduction

The purpose of the IOGP S-719 specification documents is to define a minimum common set of requirements for the procurement of water mist fire protection systems in accordance with NFPA 750, 2023, Standard on Water Mist Fire Protection Systems, for application in the petroleum and natural gas industries.

The IOGP S-719 specification documents follow a common structure (as shown below) comprising a specification, also known as a technical requirements specification (TRS), a procurement data sheet (PDS), an information requirements specification (IRS) and a quality requirements specification (QRS). These four specification documents, together with the purchase order, define the overall technical specification for procurement.


**JIP33 Specification for Procurement Documents**
**Supplementary Technical Requirements Specification (TRS)**

This specification is to be applied in conjunction with the supporting PDS, IRS and QRS as follows.

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

This specification defines technical requirements for the supply of the equipment and is written as an overlay to NFPA 750, following the NFPA 750 clause structure. Clauses from NFPA 750 not amended by this specification apply as written. Modifications to NFPA 750 defined in this specification are introduced by a description that includes the type of modification (i.e. Add, Replace or Delete) and the position of the modification within the clause.

NOTE Lists, notes, tables, figures, equations, examples and warnings are not counted as paragraphs.

**IOGP S-719D: Procurement Data Sheet for Water Mist Fire Protection Systems (NFPA)**

The PDS defines application-specific requirements. The PDS is applied during the procurement cycle only and does not replace the equipment data sheet. The PDS may also include fields for supplier-provided information required as part of the purchaser's technical evaluation. Additional purchaser-supplied documents may also be incorporated or referenced in the PDS to define scope and technical requirements for enquiry and purchase of the equipment.

**IOGP S-719L: Information Requirements for Water Mist Fire Protection Systems (NFPA)**

The IRS defines information requirements for the scope of supply. The IRS includes information content, format, timing and purpose to be provided by the supplier, and may also define specific conditions that invoke the information requirements.

**IOGP S-719Q: Quality Requirements for Water Mist Fire Protection Systems (NFPA)**

The QRS defines quality management system requirements and the proposed extent of purchaser conformity assessment activities for the scope of supply. Purchaser conformity assessment activities are defined through the selection of one of four generic conformity assessment system (CAS) levels on the basis of evaluation of the associated service and supply chain risks. The applicable CAS level is specified by the purchaser in the PDS or in the purchase order.

The specification documents follow the editorial format of NFPA 750 and, where appropriate, the drafting principles and rules of ISO/IEC Directives Part 2.

The PDS and IRS are published as editable documents for the purchaser to specify application-specific requirements. The TRS and QRS are fixed documents.

The order of precedence of documents applicable to the supply of the equipment, with the highest authority listed first, shall be as follows:

a) regulatory requirements;

b) contract documentation (e.g. purchase order);

c) purchaser-defined requirements (e.g. PDS, IRS and QRS);

d) this specification;

e) NFPA 750.

# Chapter 2 Referenced Publications

## 2.1 General

*Add to section*

The following publications are referred to in this specification, the procurement data sheet (IOGP S-719D) or the IRS (IOGP S-719L) in such a way that some or all of their content constitutes requirements of these specification documents.

## 2.3 Other Publications.

### 2.3.5 ISO Publications.

*Add to section*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

### 2.3.9 Other Publications.

*Add to section*

EN 14972-1:2020, *Fixed firefighting systems - Water mist systems - Part 1: Design, installation, inspection and maintenance*

IEC 60079 (all parts), *Explosive atmospheres*

IOGP S-703, *Supplementary Specification to IEC 60034-1 Low Voltage Three Phase Cage Induction Motors*

IOGP S-705, *Supplementary Specification to API Recommended Practice 582 Welding Guidelines for Welding of Pressure Containing Equipment and Piping*

IOGP S-715, *Supplementary Specification to NORSOK M-501 Coating and Painting for Offshore, Marine, Coastal and Subsea Environments*

IOGP S-716, *Specification for Small Bore Tubing and Fittings*

IOGP S-718, *Specification for Basic Process Measurement Instruments*

IOGP S-733D, *Procurement Data Sheet for Low Voltage Motors (IEEE Std 841)*

# Chapter 3 Definitions

## 3.3 General Definitions.

### 3.3.27 Water Mist System.

**3.3.27.4**
**Local-Application Water Mist System.**

*Add new note 1 to entry*

Note 1 to entry: For marine applications, local application systems as defined by MSC.1/Circ. 1387, are first response systems to provide time for the main system (total volume protection) discharge.

# Chapter 5 Classification of Occupancies

## 5.2 Classification of Specific Applications for Water Mist Systems.

### 5.2.2

*Add new list item (9)*

(9) Oil and gas applications (see Chapter 17)

***Justification***

*Where current fire test protocols do not exist, for example where technology/innovation such as lithium-ion batteries or transformers moves faster than the development of fire test protocols, this new list item permits the development of a robust water mist fire protection system. The performance and successful completion of fire testing, that is pertinent to the risk and conducted by an internationally recognized fire testing laboratory, is to be documented with a full report describing the results of the performance-based fire testing and of the component evaluations. The pass/fail criteria are to be established prior to fire testing. This is a collaboration process with qualified third parties.*

# Chapter 6 System Components and Hardware

## 6.1 General.

*Add new section*

### 6.1.4 Water Mist Package.

Water mist packages shall have a structural steel base frame with lifting lugs.

***Justification***

*Pump-based and diesel generator water mist systems are generally supplied mounted on a base frame or skid. The base frame is typically carbon steel or stainless steel, depending on the location. Water mist system manufacturers typically do not offer system components separately, as they do not want items to move or be damaged. For cylinder-based water mist systems, the system components are generally mounted within an enclosure or part of a support frame or skid. The cylinders are secured in accordance with 8.5.5.5 to prevent movement and potential damage.*

# Chapter 9 Design Objectives and Fire Test Protocols

## 9.1 General.

*Add new section*

### 9.1.5 Fire Scenario-Engineered Solutions.

For systems that do not have a listing in accordance with 9.1.1, a fire scenario-engineered solution shall be developed in accordance with Chapter 18.

***Justification***

*Where current fire test protocols do not exist, for example where technology/innovation such as lithium-ion batteries or transformers moves faster than the development of fire test protocols, this new list item permits the development of a robust water mist fire protection system. To ensure that the fire scenario-engineered solution is fit for purpose, the following has been used by the water mist industry in other industries.*

*(1) Performing and successfully completing fire testing that is pertinent to the risk at an internationally recognized fire testing laboratory gives confidence*
*(2) Establishing a pass/fail criterion prior to fire testing*
*(3) Documenting the process with a full report describing the results of the performance-based fire testing and of the component evaluations*
*(4) Creating a collaboration process with qualified third parties*
*(5) Providing a DIOM manual for the fire scenario-engineered solution*

## 9.2 Listing Evaluations.

### 9.2.6 Design and Installation Manual.

*Add new section*

**9.2.6.3**

For fire scenario-engineered water mist systems, the DIOM manual shall identify the working limits and parameters of the system, the fire hazards and the range of compartment variables.

***Justification***

*This requirement ensures that the fire scenario-engineered water mist system is robust and suitable for the intended application and equals the requirements for the listed system.*

# Chapter 12 Water Supplies and Atomizing Media

## 12.5 Water Supplies.

### 12.5.1 Water Quality.

**12.5.1.2**

*Add to section*

Where international requirements are different from 12.5.1.2 in areas where the U.S. Environmental Protection Agency does not have authority, local and international requirements shall be permitted subject to acceptance by the AHJ.

***Justification***

*For geographical locations that are outside of the U.S. environmental protection agency jurisdiction, this requirement ensures that added liquids or dissolved chemicals are compliant with the local legislation.*

*Add new chapter*

# Chapter 17 Water Mist Systems for the Oil and Gas Sector

## 17.1 General.

**17.1.1**

This chapter outlines the modifications and additions that are required for onshore, offshore and marine applications for use within the oil and gas and renewable energy industries; all other requirements of NFPA 750 apply except as modified by this chapter.

***Justification***

*This chapter ensures that the oil and gas sector has access to the latest innovative fire-fighting solutions that have been tried and tested, and then listed. It allows for the development of new water mist solutions to be considered against alternative fire-fighting technologies and where the international fire test protocols lag behind product technology such as battery energy storage systems and oil-filled transformers.*

**17.1.2**

The water mist fire protection system shall meet the design intent to mitigate the fire risk.

***Justification***

*This requirement ensures that the solutions is suitable for the risk and fit for purpose. If this is not followed, it could lead to the supply of an inferior water mist solution, resulting in the inability to control the fire as intended.*

### 17.1.3 DIOM Manual or Technical File.

The DIOM manual or technical file shall include the following:

(1) Details of engineered components that are not listed, such as nozzles

(2) Details of engineered components that are derived from a family or a series of components and that are listed

***Justification***

*This requirement states the critical information to be included in the technical file or DIOM manual. The information regarding components that are not listed is to ensure for fire scenario-engineered solutions that the components are not of inferior quality to those of listed status. This gives all parties confidence that these components do not prematurely fail, leading to a water mist fire protection system that may not work as intended.*

## 17.2 System Components and Hardware.

### 17.2.1 Efficacy and Reliability.

The efficacy and reliability of the water mist fire protection system shall be as follows:

(1) For offshore systems utilizing listed systems, compliant with 16.1.2.1 and 16.1.2.2

(2) For fire scenario-engineered solutions for marine/offshore and onshore applications, compliant with Chapter 18

***Justification***

*The requirement clarifies that for marine applications, there are existing rules. Historically, these requirements for marine applications are often applied to offshore applications as the AHJ is normally the classification society. For onshore applications, the listing organization defines the component test. To achieve successful fire performance testing for fire scenario-engineered solutions, components may need to be engineered to perform and achieve the required results for this solution. This information is to be documented within a technical file to be provided alongside the DIOM manual.*

Note: 17.2.1 provides evidence of traceability back to the identified listed components to give confidence of component quality and reliability.

### 17.2.2 Pump Redundancy.

**17.2.2.1**

For offshore applications, pump redundancy shall be in accordance with 16.1.6.

***Justification***

*The requirement for redundancy is clearly defined for marine applications. Historically, these requirements for marine applications are often applied to offshore applications as the AHJ is normally the classification society. For onshore applications, good working practice recommends that pump redundancy is needed. The requirement of redundancy ultimately lies with the AHJ.*

Note: For pumping system redundancy, the capacity is to be sufficient to compensate for the loss of any single supply pump.

**17.2.2.2**

Pump redundancy shall not be applied to local application water mist systems that are not the primary means of fire protection.

***Justification***

*For local application water mist systems (e.g. example an engine room) that are not the primary means of fire protection, when combined with a total flooding system, the requirement for redundancy is clearly defined for marine. This logic is often applied to offshore applications as the AHJ is normally the classification society. For onshore applications, good working practice recommends that pump redundancy is also not required when total flood is present.*

### 17.2.3 Controls and Alarms.

**17.2.3.1**

For offshore applications, annunciation shall be in accordance with 16.1.7.2.

***Justification***

*The requirement for annunciation is clear for marine. Historically, these requirements for marine applications are often applied to offshore applications as the AHJ is normally the classification society. For onshore applications, NFPA 750 is sufficient. Good working practice would recommend that pump redundancy is required. Annunciation ultimately lies with the AHJ.*

**17.2.3.2**

For offshore applications, the flow condition alarm shall be in accordance with 16.1.7.3.

***Justification***

*The requirement for flow condition alarms is clearly defined for marine and onshore applications within NFPA 750. This logic is commonly applied to offshore applications as the AHJ is normally the classification society. The location of the alarm sound ultimately lies with the end user's fire strategy and the AHJ.*

**17.2.3.3**

For offshore applications, pressure monitoring shall be in accordance with 16.1.7.4.

***Justification***

*The requirement for pressure monitoring is clearly defined for marine and onshore applications within NFPA 750. This logic is commonly applied to offshore applications as the AHJ is normally the classification society.*

## 17.3 Installation.

### 17.3.1 Protected Compartments Integrity.

**17.3.1.1**

For protected compartments and rooms, permitted openings shall be defined in the manufacturer's DIOM manual and water mist system approval report.

***Justification***

*The opening dimensions are critical for a water mist system working as intended. To ensure integrity, the system acceptance highlights any areas of concern that could lead to a fire not being controlled as intended. This could lead to the property/personnel not being suitably protected from fire.*

**17.3.1.2**

For protected compartments and rooms, the ventilation parameters shall be defined in the manufacturer's DIOM manual and water mist system approval report.

***Justification***

*The ventilation for protected compartments and rooms is not as critical as gaseous fire protection systems are for the water mist system to work as intended. To ensure integrity, the system acceptance highlights any areas of concern that could lead to a fire not being controlled as intended. This could lead to the property/personnel not being suitably protected from fire.*

**17.3.1.3**

For protected spaces and objects, the water mist shall be supplied via sectional control valves.

***Justification***

*Section valves are needed in a water mist system to divide the water mist system into different sections. For a wet-pipe system, in the event of fire, the nozzle activates by bulb breakage, causing flow through the valve. The flow is detected within the section valve, which in turn sends a signal to the control panel, identifying the activated section. For a dry-pipe open nozzle system, in the event of fire, the fire detection system sends a signal to the control panel to identify the section to be activated. Section valves are typically installed in fireproof enclosures or not within the area being protected. Without section valves, maintenance of the system would be unworkable.*

### 17.3.2 Location of Water Mist Supply Components.

**17.3.2.1**

For offshore applications, the water mist supply components shall be located in accordance with 16.2.13.

***Justification***

*It is good practice that safety-critical items are located in a fire pump room / water mist plant room. However, this location may not be available for marine (e.g. FPSO) applications, therefore this requirement directs the user to 16.2.13 for the marine environment. For offshore applications, this is also applicable when at the acceptance of the AHJ.*

Note: The location for water mist supply components is also known as the water mist pump room or water mist fire-fighting skid enclosure.

**17.3.2.2**

The location of water mist supply components shall be dry and free of condensate.

***Justification***

*Moisture and condensation could be an indication of an environment that is too hot or cold and with insufficient ventilation. 6.10.3.4 is clear on the temperature limitations of the water mist system. Moisture and condensation can lead to electrical issues, causing the system not to work correctly. This requirement aligns with NFPA 20:2022, A.4.14.7.*

**17.3.2.3**

Enclosed fire-fighting skids shall have artificial and emergency lighting.

***Justification***

*Lighting is required in the location of the water mist supply components for installation, maintenance and use of the water mist system. Even in well-lit areas, access is required 24/7, therefore artificial lighting is required. Emergency lighting is required in the event of a power outage so that full operational status can be maintained. This aligns with NFPA 20:2022, 4.14.4 and 4.14.5.*

## 17.4 Flammable Liquids and Gases.

For offshore applications, total volume protection systems shall be in accordance with 16.3.

***Justification***

*This requirement clarifies the differences between the types of water mist protection. This requirement gives clear direction as the oil and gas sector is not fully conversant with this subject matter.*

Note: Total volume protection is also known as total flooding or compartment protection.

## 17.5 Human Factors.

Human factors for water mist fire protection systems shall be in accordance with 16.4.

***Justification***

*There is no mention for land/onshore applications in NFPA 750 for human factors. 16.4 in the chapter for marine systems and A.16.4 are also applicable to offshore and onshore applications and would be considered good working practice by water mist system suppliers.*

*Add new chapter*

# Chapter 18 Fire Scenario-Engineered Solutions

## 18.1 General.

### 18.1.1

This chapter outlines the requirements for fire scenario-engineered water mist systems that can be used where international fire test protocols and listings do not exist; all other requirements of NFPA 750 and this standard apply except as modified by this chapter.

***Justification***

*This chapter gives clear direction on the use of fire scenario-engineered solutions when accepted by the AHJ, ensuring that water mist systems are developed in accordance with EN 14972 and clarifying the importance of the DIOM manual for water mist systems. This paragraph states that fire scenario-engineered water mist systems can only be considered in the absence of an international fire test protocols and listings. It is not intended that fire scenario-engineered water mist systems are offered as a workaround when the supplier does not have a listed product for an application. The purpose of fire scenario-engineered water mist systems is that they can be considered when accepted by the AHJ for special applications. C.1 provides informative guidance on this subject.*

### 18.1.2

The fire scenario-engineered solution shall be approved by the AHJ for the defined application.

***Justification***

*The AHJ, as defined in 3.2.2, is the third party along with the owner and the supplier being the other two parties, this would ensure that the fire scenario-engineered solution is fit for purpose. The AHJ is more neutral in reviewing the fire scenario-engineered solution for the application. The protection of the asset and personnel is critical, and the use of a fire scenario-engineered solution should not be taken lightly.*

## 18.2 Purpose.

### 18.2.1

The fire scenario-engineered solution shall be a collaborative fire-engineered solution that is developed and agreed on a case-by-case basis.

***Justification***

*To ensure that the oil and gas sector has access to the latest innovative firefighting solutions for potential application, Chapter 18 has been developed to ensure that the intent of NFPA 750 is met. C.1 outlines that fire test protocols should be based on a fire protection engineering evaluation of the fire hazard, the compartment, and the performance objectives of the water mist system. The fire scenario-engineered solution is an agreed collaboration between the water mist supplier, the accredited fire-testing laboratory and the purchaser's representative. In instances where the AHJ is not the operator, the external AHJ may also be involved.*

### 18.2.2

The fire scenario-engineered solution shall use existing test results and knowledge to develop a solution to provide fire protection.

***Justification***

*To ensure that the oil and gas sector has access to the latest innovative firefighting solutions for potential application, Chapter 18 has been developed to ensure that the intent of NFPA 750 is met. The fire scenario-engineered solution is an acceptable solution between the water mist supplier, the accredited fire-testing laboratory and the purchaser's representative. In instances where the AHJ is not the operator, the external AHJ may also be involved. The preference is to use existing test results and knowledge to develop a water mist solution. It could be feasible that less scrupulous water mist suppliers could offer solutions that were only part similar to the risk. Therefore, it is essential that the fire test is representative of the fire risk in the real world. Any short cuts in fire testing could have catastrophic consequences.*

**18.2.3**

Unless the requirements of 18.1.3.2 are met, the fire scenario-engineered solution shall use fire testing conducted by an internationally recognized and accredited fire-testing laboratory.

***Justification***

*To ensure that the oil and gas sector has access to the latest innovative firefighting solutions for potential application, Chapter 18 has been developed to ensure that the intent of NFPA 750 is met. C.1 outlines that fire test protocols should be based on a fire protection engineering evaluation of the fire hazard, the compartment, and the performance objectives of the water mist system. It could be feasible that less scrupulous water mist suppliers could offer solutions that were only part similar to the risk. Therefore, it is essential that the fire test is representative of the fire risk in the real world. Any short cuts in fire testing could have catastrophic consequences.*

**18.2.4**

To achieve the requirements of 18.1.3.3, fire testing for a fire scenario-engineered solution shall be based on the fire protection engineering evaluation of the fire hazard.

***Justification***

*To ensure that the oil and gas sector has access to the latest innovative firefighting solutions for potential application, Chapter 18 has been developed to ensure that the intent of NFPA 750 is met. C.1 outlines that fire test protocols should be based on a fire protection engineering evaluation of the fire hazard, the compartment, and the performance objectives of the water mist system. It could be feasible that less scrupulous water mist suppliers could offer solutions that were similar to the risk. Therefore, it is essential that the fire test is representative of the fire risk in the real world. Any short cuts in fire testing could have catastrophic consequences.*

## 18.3 Fire Scenario-Engineered Solution Systems.

For fire scenario-engineered systems, evidence of the following shall be provided:

(1) Fire scenario-engineered solution (see this chapter)

(2) Fire test protocols (see 18.4)

(3) Component evaluation (see 18.3)

(4) Fire scenario-engineered test report (see 18.5.1)

(5) Fire scenario-engineered test documentation (see 18.5)

***Justification***

*To ensure that the oil and gas sector has access to the latest innovative firefighting solutions for potential application, Chapter 18 has been developed to ensure that the intent of NFPA 750 is achieved. C.1 outlines that fire test protocols are to be based on a fire protection engineering evaluation of the fire hazard, the compartment, and the performance objectives of the water mist system. With the test protocols being conducted by internationally recognized fire testing laboratories as specified in 18.4.3, as this ensures alignment with the intent of NFPA 750. The reasons for ensuring that the intent of NFPA 750 is met include the following:*

*(1) A clear agreed solution, between the water mist supplier and the AHJ to demonstrate that the performance objectives of the water mist system meet the objectives in successfully completing fire testing that is pertinent to the risk*

*(2) To allow for water mist solutions to be considered against other more conventional firefighting technologies, to protect more applications from fire*

*(3) To restrict the use of components that are fit for function and can be proven to be so and to ensure that components other than nozzles are subjected to the same testing rigors of listed components as per C.1.1*

*(4) To provide evidence that the performance objectives of the water mist system meet the objectives that are defined prior to testing and that are pertinent to the risk*

*(5) The detailed version of the fire scenario-engineered test report, including testing data*

## 18.4 Fire Scenario-Engineered Solution Components.

### 18.4.1

Components that are not listed in accordance with 6.1.1 shall be tested as part of the fire scenario-engineered solution.

***Justification***

*For fire scenario-engineered solutions components may need to be engineered to perform and achieve the required results for a new application and fire test protocol. Typically, listed components would be used by the water mist manufacturer, as these would have already passed extensive testing, as defined in the listing. In rare instances, there could be the need for a new component. Generally, the water mist manufacturer would look to utilize an existing listed component, with minimal modification. This is documented within a DIOM manual or a technical file. The use of a new component would require approval by the AHJ and be part of the fire scenario-engineered solution. This requirement ensures that the quality and reliability of a new component will be comparable with listed items, leading towards a system that is fit for purpose.*

### 18.4.2

For fire scenario-engineered systems, the following primary components shall be performance tested during the manufacturing process of the water mist fire protection system prior to factory acceptance testing (FAT):

(1) Nozzles

(2) Flexible hoses

(3) Gas and water containers

(4) Manifolds

(5) Pump systems

(6) Valves

***Justification***

*As a fire scenario-engineered system is not listed, it is critical that these primary items are tested as if they were part of a listed system. By performing tests comparable to those that the water mist supplier would perform as part of a listed solution, results in comparable or equivalent quality of product, which would lessen the chance of failure or poor product.*

**18.4.3**

Component testing for fire scenario-engineered solutions shall be in accordance with the pass/fail criteria of a recognized international procedure (e.g. FM Approvals *Approval Standard for Water Mist Systems* Class Number 5560 and MSC/Circ. 1165).

***Justification***

*When considering fire scenario-engineered solutions, fire scenario-engineered components are to perform and achieve the required results as those in a listed system. This is documented within a DIOM manual or technical file. This gives confidence that any deviations from listed components do not negatively impact the system performance or reliability.*

Note: MSC/Circ.1165 applies to nozzles only.

**18.4.4**

Fire scenario-engineered testing protocols shall be designed for the defined performance objectives of the application.

***Justification***

*The performance objectives, as defined in the procurement data sheet helps develop the fire testing for a fire scenario-engineered solution to be pertinent to the risk. By being in accordance with EN 14972-1:2020, Annex A, this ensures the test represents the real-world scenario. If testing is not representative of the risk, this could lead to the property/personnel not being suitably protected from fire. The application characteristics and evaluations are defined in 9.1.2 and 9.1.3. The fire test protocol, when considering the fire hazard, the compartment conditions and the performance objective, ensures confidence in the proposed fire-fighting solution.*

## 18.5 Fire Scenario-Engineered Solution Fire Test Protocols.

**18.5.1**

Fire scenario-engineered fire test protocols shall have a predefined pass/fail criteria.

***Justification***

*Fire testing for a fire scenario-engineered solution by having a predefined pass/fail criteria in accordance with EN 14972-1:2020, Annex A gives confidence that beyond reasonable doubt, the system is fit for purpose. This ensures that the test represents the real-world scenario. If the testing is not representative to the risk, it can lead to the property/personnel not being suitably protected from fire.*

**18.5.2**

For fire scenario-engineered solutions, fire test protocols shall be developed in accordance with EN 14972-1:2020, Annex A.

***Justification***

*Fire testing for a fire scenario-engineered solution that is in accordance with EN 14972-1:2020, Annex A gives confidence that beyond reasonable doubt, the system would be fit for purpose. EN 14972-1 is the most internationally recognized guideline for developing fire test protocols. This is used in other sectors to develop fire test protocols where gaps in listed applications exist. Further guidance is found in Annex C. This ensures that the test represents the real-world scenario. If the testing is not representative to the risk, this could lead to the property/personnel not being suitably protected from fire.*

**18.5.3**

Fire scenario-engineered solution fire testing shall be conducted by an ISO/IEC 17025 accredited laboratory in the presence of the third-party authorities.

***Justification***

*Fire testing for a fire scenario-engineered solution conducted by an organization that is technically competent and able to generate technically valid results aligns with other industries using this approach. By following EN 14972-1:2020, Annex A and by operating to ISO/IEC 17025, the test facility demonstrates the testing, recording of the test results and the subsequent test report is accurate and gives confidence that beyond reasonable doubt, the system is fit for purpose. If the testing is not representative to the risk, this could lead to the property/personnel not being suitably protected from fire.*

## 18.6 Fire Scenario-Engineered Solution Test Report.

**18.6.1**

For fire scenario-engineered solutions, the fire test report shall contain the items listed in EN 14972-1:2020, A.8, a) to h).

***Justification***

*For fire scenario-engineered solutions, a test report following EN 14972-1:2020, A.8, a) to h) demonstrates and gives confidence that the testing results in an evaluation that establishes the water mist system is fit for purpose. This requirement is written so that it turns the recommendations of EN 14972-1:2020, A.8 into a requirement. EN 14972-1 is the only internationally recognized standard for developing representative fire test protocols.*

**18.6.2**

The fire scenario-engineered test report shall be within or accompanying the DIOM manual.

***Justification***

*The fire scenario-engineered test report is required to accompany the water mist system as evidence of testing for suitability in the absence of it not being a listed system. This is typically performed by the supplier for water mist systems that have been developed for representative fire test protocols.*

# Annex A
# Explanatory Material

**A.4.1**

*Add new list item (10)*

(10) Oil and gas applications such as turbine enclosures, reciprocating internal combustion engines, compressors, generators, pumps, transformers, machinery spaces, accommodation spaces, stores, galley ducts, deep fat fryers, cable rooms, switch gear rooms, control and server rooms, UPS/battery rooms, hydraulic power packs and process areas

***Justification***

*This explanatory material complements A.4.1 in identifying potential applications that are applicable to the oil and gas sector. When developing the first edition of this specification, it was agreed that blast protection would not be included in this specification, due to the lack of substantiated evidence. This is also true at the time of writing the second edition.*

# Annex E
# Informational references

*Add new section*

## E.4 Additional informational references

The following documents are informatively cited in the text of this specification, the PDS (IOGP S-719D) or the IRS (IOGP S-719L).

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

API Specification Q2, *Specification for Quality Management System Requirements for Service Supply Organizations for the Petroleum and Natural Gas Industries*

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EN 10204, *Metallic products - Types of inspection documents*

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ISO 9001, *Quality management systems — Requirements*

ISO 10005, *Quality management — Guidelines for quality plans*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 11014, *Safety data sheet for chemical products — Content and order of sections*

IEC 60034-5, *Rotating electrical machines – Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) – Classification*

ISO/IEC 17000, *Conformity assessment — Vocabulary and general principles*

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