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Guidance on Industry Standard for Fine Water Mist Spray Systems

GIS 24-071

BP GROUP
ENGINEERING TECHNICAL PRACTICES

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GIS 24-071.

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1. Scope

This Guidance on Industry Standard (GIS) provides guidance for design, materials, construction, installation, testing and inspection, and documentation for fine water mist spray systems. This GIS is performance based (i.e., system shall be designed to put out range of fire cases and operate effectively under range of specified conditions).

2. Normative references

The following normative documents contain requirements that, through reference in this text, constitute requirements of this technical practice. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this technical practice are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

BP Group Engineering Technical Practices (ETPs)

GP 12-45	Guidance on Practice for Electrical for Packaged Systems
GP 24-07	Guidance on Practice for Alternatives to Halon 1211, 1301 and 2402 Fire Fighting Suppressants
GP 34-00	Guidance on Practice for Rotating and Machinery Equipment
GP 46-01	Guidance on Practice for Pressure Vessels
GP 60-50	Guidance on Practice for General Issues – Equipment Packages

Department of Transportation U.S. (DOT)

3AA-2300
4BA-500

National Fire Protection Association (NFPA)

NFPA 20	Installation of Stationary Pumps for Fire Protection.
NFPA 70	National Electrical Code (NEC).
NFPA 750	Water Mist Fire Protection Systems.

Underwriters Laboratories

UL 2167	Standard for Safety Water Mist Nozzles for Fire Protection Service.
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3. Symbols and abbreviations

For the purpose of this GIS, the following symbols and abbreviations apply:

ESD	Emergency shutdown.
FACP	Fire alarm control panel.
FWM	Fine water mist (spray system).
NRTL	Nationally recognized testing laboratory.



4. Governing codes

- a. FWM systems shall comply with current or draft codes that are appropriate and necessary to ensure reliability and effectiveness.

No current codes can be reliably used as the sole basis for the design of all types of FWM systems. Therefore, simple compliance with a particular code is not considered adequate basis of design.

- b. FWM systems shall comply with NFPA 750 and this GIS.
- c. Electrical systems shall comply with GP 12-45.
- d. Pumps shall comply with NFPA 20 and information in GP 34-00.
- e. FWM systems shall comply with applicable local codes and standards.

In Alaska, FWM systems shall also comply with:

- *Alaska administrative code 13-AAC-50.*
- *International building code (IBC).*
- *International fire code (IFC).*

In Alaska, FWM systems shall be of standard approved by Alaska state fire marshal.

In Alaska, FWM systems shall comply with Alaska administrative code.

- f. Unless specified otherwise by BP, in event of conflict between this GIS and listed codes, the more stringent shall govern.

5. System design

5.1. General compliance and requirements

- a. Each FWM system shall be designed specifically to meet range of:
 1. Fire hazards.
 2. Enclosure dimensions.
 3. Ventilation conditions.
 4. Combustion conditions.
- b. FWM system design shall follow the requirements in GP 24-07.
- c. Vendor shall perform applicable fire testing and develop effective design parameters sufficient to demonstrate extinguishment of range of fires and conditions identified for each hazard area.

5.2. Standards

- a. FWM systems that have been tested and approved by independent organisations (e.g., Factory Mutual [FM], Underwriters Laboratories [UL], or International Maritime Organisation [IMO]) shall not be assumed to provide assurance of suitability and effectiveness for fires and conditions specified.
 1. If approval does not explicitly state limits of applicability of system, Vendor or approvals authority shall:
 - a) Provide appropriate assurance of suitability and performance for identified hazards and fire conditions.
 - b) Assume responsibility and liability for system performance.



5.3. Design basis**5.3.1. General**

- a. Pump driven systems and nitrogen pressurised systems are acceptable.
- b. Design criteria shall be stated with proposal.
- c. Detailed design information shall be provided for approval prior to fabrication and construction.
- d. If not specifically stated in this GIS, the system shall conform to the requirements in GP 60-50.

5.3.2. Nozzle and delivery

- a. Vendor shall design, install, and commission total compartment deluge type water mist system having non automatic (open) water mist nozzles spaced throughout protected area in accordance with Vendor design and installation manual.
- b. System shall deliver water mist at approximately constant pressure for minimum flow duration of 30 min.

5.3.3. Design specifics

- a. Structure and piping engineering drawings of facility will be provided by BP.
- b. Vendor shall use drawings to determine floor area and volume of compartment to be protected.

5.3.4. Test protocol

- a. Vendor shall submit documentation to confirm that proposed FWM system has passed fire tests and component evaluations of internationally recognised fire test protocol for machinery spaces or special hazard machinery spaces having volumes larger than facility to be protected.
- b. Typically facility volumes will be greater than 280 m³ (10,000 ft³).
- c. Acceptable test protocols:
 - 1. IMO: Test protocol for Category A marine machinery spaces and cargo pump-rooms.
 - 2. FM: Test protocol for combustion machinery spaces and special hazard machinery spaces larger than 280 m³ (10,000 ft³).
 - 3. UL 2167: Test protocol for machinery spaces larger than 280 m³ (10,000 ft³).

5.4. Water supply

- a. Suitable filters shall be provided to ensure that facility fresh water supply for FWM system is equivalent to potable water with respect to particulate and dissolved solids as required by NFPA 750.
- b. Additives or antifreeze shall be approved by U.S. environmental protection agency (EPA) or other relevant agency for use in deluge fine water mist systems.

5.5. Water storage

- a. If FWM is not directly connected to plant fresh water supply, FWM shall have single vessel storage tank with sufficient water capacity to fulfil design intent and provide reserve supplies as required to allow pressurisation (if needed) during operation.
- b. If very large quantities of water are required, FWM may have more than one vessel if it is less costly or enhances standardisation.

