



Maintenance Requirements for Water Mist Systems

Effect of Lack of Maintenance



15 Oct. 2004

**East Tower of Parque Central Building
(56 floors) in Caracas, Venezuela**

- Building protected by a sprinkler system
 - Fire began on the 34th floor
 - Sprinkler system was not in working conditions since it was not maintained
- ➔ **Fortunately building was not occupied, but the fire damage was 250 Mio \$**



Typical Applications for Water Mist Systems



- Heritage Buildings
- Museums
- Theatres



- Hospitals
- Laboratories
- Care Homes



- Libraries
- Archives

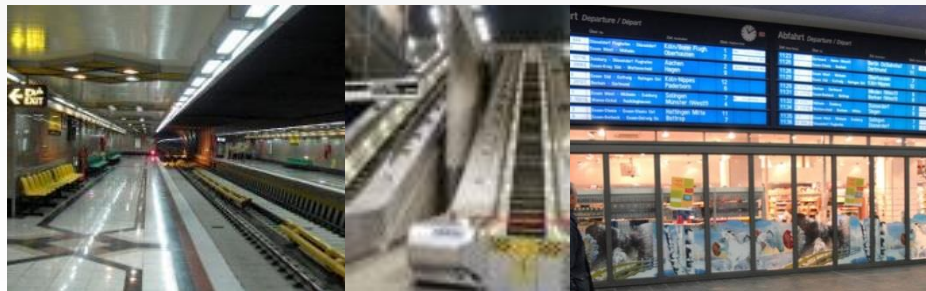
Typical Applications for Water Mist Systems



- IT Rooms
- Data Centres
- Telecommunication Areas



- Cable Tunnels



- Underground Stations

Typical Applications for Water Mist Systems



- Flammable Liquid Storage
- Paint Booths
- Hydraulic Areas



- Machinery Spaces
- Turbines
- Generators



- Deep Fat Fryers

Observed Problems leading to Malfunction



- **Blocked or obstructed nozzles**
- **Loose pipework**
- **Corroded pipework**
- **Clogged filters**
- **Poor water supply and water quality**
- **Incorrect position of shut-off valves**
- **Poor housekeeping in the pump room or at section valves**

Necessity of Maintenance

- Ensuring the function and operability of the system
- Risks result from
 - Mechanical wear
 - Component defects
 - Modifications in water or power supply
 - Accidents / vandalism
- Inspection for structural changes and changes in fire risk
- Maintaining the approval of the protected area by the fire authority / insurer
- Maintaining warranties from system supplier
- ➔ Minimising financial losses or even danger for human lives

Maintenance Definition (CEN TS 14972)

Maintenance

Combination of all technical and administrative actions, including supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function

Qualified Company

Company registered by a national body or accepted by the authorities having jurisdiction for design, installation and maintenance of fixed water mist systems and fully trained and authorized by the manufacturer

Maintenance Definition (CEN TS 14972)

Intervals

The maintenance shall be in accordance with the manufacturer's design and installation manual. Minimum once a year the system shall be maintained in accordance with the manufacturer's instructions by a company authorized by the manufacturer

Training

All persons who may be expected to inspect, test, maintain, or operate water mist firefighting systems shall be trained by the manufacturer's and kept adequately trained in the work they are expected to perform

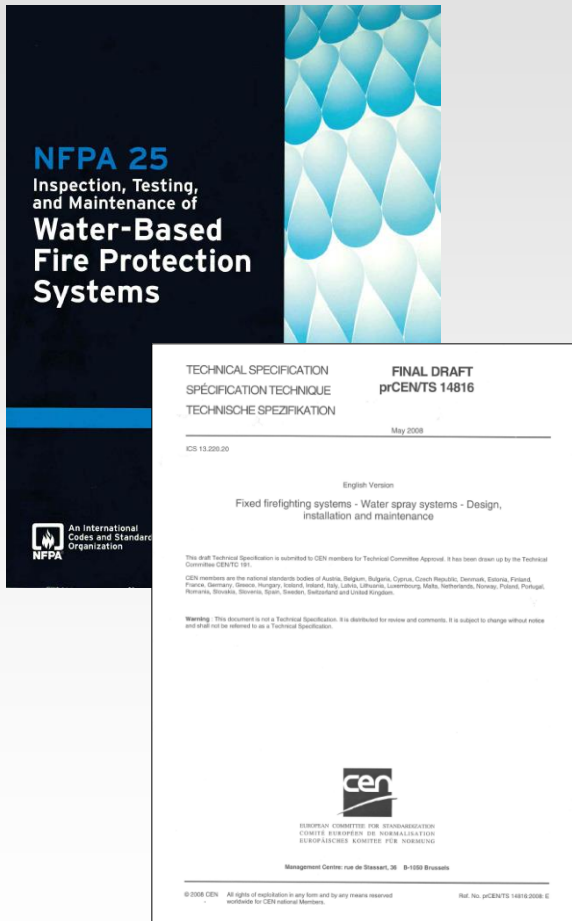
Importance of Guidelines and Standards

Applicable Standards

- NFPA 25
- CEN TS 14972
- BS DD 8489

Definition of

- Uniform maintenance procedures
 - Schedules for periodic maintenance
 - Who is authorized to carry out maintenance
- ➔ Requirement for an Operation and Maintenance Manual by the manufacturer



Content Operation and Maintenance Manual

- Any limitations in areas where the water mist system can be used safely
- Listing of additives that can be safely used
- Monitoring program for systems and components including instruction on the action to be taken in respect of faults
- General maintenance instructions
- Schedule for maintenance by a competent person
- Instructions to the user to keep records, including a logbook
- Instructions to the user to set the system, in conjunction with any automatic pumps, pressure tanks and gravity tanks, to its proper operational condition

Maintenance Items Covered in Standards

Responsibility

- Obligation of the property owner

Correction or repair

- Damaged parts

System re-evaluation / Modification

- Occupancy changes / Changes in obstructions or ventilation
- Changes in fire load

Inspection and testing

- Concerned components
- Maintenance intervals

Maintenance Items Covered in Standards

Documentation / Reports

- Comprehensive record of works carried out

Training

- Maintenance carried out by companies trained and authorised by the system manufacturer

Main Maintenance Items



Water supply

- Source pressure and quality
(Physical / chemical / microbiological)

Water storage cylinders

- Water content and quality



Water break tanks

- Water content and quality
- Water supply devices (valves)
- Level alarms

Compressed gas cylinders

- Cylinder pressure / Filling

Main Maintenance Items



Pumps and drivers

- Mechanical transmission
- Pump bearings / Seals
- Filters
- Control valves / Check valves
- Sensors and switches
- Flow rate and pressure
- 10 min. test run



Control equipment

- Operation tests

Main Maintenance Items



Directional (Section) valves

- Operation tests (flow)

Depending from type of valve

- Sensors and switches
- Seals



Main Maintenance Items



Piping

- Pipe support
- Pipe fittings
- Corrosion
- Damages



Nozzles

- Damages
- Dirt or corrosion
- Filters
- Obstructions

Maintenance Intervals

Weekly / Monthly

- Position of control valves
- Inspection of pressure gauges
- Inspection of tank levels
- Automatic pump start test
- Pressurized cylinder pressure

Quarterly / Half yearly

- Visual nozzle inspection
- Visual inspection of pipework and pipe supports
- Section valve operation test
- Review of protected hazard

Maintenance Intervals

Yearly

- Automatic pump flow test
- Cleaning of water tanks
- Cleaning / changing pump system strainers
- Test of infill to water tanks
- Inspection of section valves

3 yearly / 10 yearly

- Tank drainage, cleaning and refill
- Inspection of all valves
- Sample nozzle inspection (20 nozzles or 1% of installed nozzles)
- Testing of pressure vessels
- Pipework pressure test

Conclusion

- **Maintenance is vital for operational availability of water mist systems**
- **Maintenance requirements for water mist systems are comparable to conventional sprinkler and gas extinguishing systems**
- **Uniform maintenance routines shall be applied throughout the water mist industry**
- **Only companies trained and authorized by the manufacturer can offer adequate services**



Thank you for your attention!



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