Implementation of Water Mist Systems in Road Tunnels

Project Case Studies

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ISTSS Stockholm, March 2008
Tunnel Fire Protection

A86 Tunnel in Paris
A86 Tunnel

Paris, France

The A86 West is the link in the 80 km long A86 ring road around Paris.
A86 Tunnel

Static height difference ca. 135 metres
A86 Tunnel

Special geometry - tunnel is designed only for passenger vehicles
A86 Tunnel
A86 Tunnel

Main safety features

- Linear heat detection
- CCTV cameras
- Semi-transversal ventilation
- Mobile emergency service
- Water mist fire protection
- Escape routes between the levels in every 200m
- Emergency exits to the ground in every 1000m
A86 Tunnel

- FEED WATER PUMPS
- HIGH PRESSURE PUMP UNITS
- 4.5km
- 5.5km

PUMP STATION RUEIL-MALMAISON
PUMP STATION A13
PUMP STATION PONT-COLBERT
A86 Tunnel
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A86 Tunnel
Water mist deluge type system: 3 x 33m zones

Design water flow ca. 1200 l/min, at 70 bar

Three pump stations

~ 16000 spray heads

~ 850 zones

~ 24 km of tunnels in total will be protected
M30 Tunnel in Madrid
M30 Tunnel

Madrid, Spain

M30 ring road tunnels is the largest known urban tunnel project.

Marioff protects areas close to Puente del Praga.
M30 Tunnel

- 8 m
- 12 m
- 14…17 m

Tunnel widths

△ Pump stations
M30 Tunnel

The main objective was to provide a fire suppression system with reasonable water consumption for large, wide tunnels

- Full scale fire tests prove system efficiency and design
- Tested, verified options: deluge, hybrid, and sprinkler
HI-FOG design for M30 tunnel

- **Hybrid system** design for 3 x 24 meter long zones
- Flow rate ca. 4000 l/min
- Two pump stations and redundant units
- 3000 spray heads and tunnel sprinklers in 98 zones
- Coverage is 2.4km in five different tunnels
M30 Tunnel
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Conclusions

- Marioff’s water mist tunnel design is based on the various full scale fire tests

- Marioff’s water mist systems have a good performance with low water consumption

- Water mist systems are recognised by third parties and customers to be efficient, viable solution in tunnels
Thank you!