Abstract:

Watermist Protection on Railway Vehicles:

The Italian Approach

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Abstract

[*Background*]
In comparison with many European Union states, Italian railways have an extensive network of tunnels through which their rolling stock must travel. This exposes both trains and passengers to increased safety risks, and particular to increased fire risk. This consideration was the starting point for an extensive upgrade of safety measures by both the Italian government and safety, consumer organizations over recent years which has culminated in a legislative document entitled UNI11565.

[*Objective*]
UNI11565 includes fire detection and fire suppression guidelines, and sets benchmarks and targets for both system types, introducing for the first time a comprehensive "standard of approval" for fire detection and suppression for Italian Railways. This case study focuses on the requirements for achieving the approval for a watermist system under Italian Rule UNI11565 as described in Appendix B, and outlines some of the challenges in a real life test scenario performed by Ultrafog.

[*Method*]
A series of fire tests were conducted on 3 different scenarios simulating various train configurations: single deck, double deck and small compartment. Two different fire configurations have been prepared inside a mock-up. All scenarios have been tested, each with the location of the fire source immediately below one nozzle and in the middle of two nozzles.

[*Results*]
Testing session revealed very good results of watermist protection in all configurations and capability of the system to control different kinds of fire to ensure a safe evacuation of the wagon keeping temperatures down to prescribed levels.

[*Main conclusions and recommendations*]
Testing sessions highlighted the importance of a long spray time to keep temperature under control as long as possible, as well as the importance of finding a good balance between K factor and operating pressure in order to optimize the performance of the system, within a context which limits the system design to very reduced quantities of water due to space limitations on the wagons.

KEYWORD: watermist systems, pressurized cylinders systems, rolling stock protection, trains.