

Innovation in water based fire suppression

The 2016 International Water Mist Conference reflected that incorporating different technologies advances the impact of fire protection immensely, and that water mist is a strong part within that concept. Two speakers focused on recent, notable advances

"AEROSOL TURBINES FOR mitigation of harmful emissions and firefighting" was the title of EmiControls' sales director Francesco Fritz presentation. Francesco confirmed that EmiControls have developed an aerosol turbine for stationary or mobile applications which is able to combine fine droplets and high throw distance through the generation of a high-speed air stream.

He reported: "We have tested the turbine to abate combustion or evaporation gases of Trichlorosilane (HSiCl₃) in a tunnel at the 'Institut der Feuerwehr' in Heyrothsberge, Germany. We collected the falling water mist into pools and measured the concentration of the gas absorbed in the water."

The firefighting tests had been conducted in the MOL refinery in Hungary with pool fires of 160 square metres, 2,400 litres of fuel and heat release rates up to 350 megawatts.

In the tunnel tests, the best gas mitigation rate of 75 per cent was achieved with the turbine method. In other open-air scenarios, rates of more than 90 per cent were achieved.

He continued: "In firefighting tests with the turbine, we could knock down the flames to 5 per cent of the initial heat release rate after 20 seconds versus 65 seconds when using the traditional technique. The turbine allows a gentle application of the water-foam mixture on the surface of the burning fluid, it can surround small objects located on the airflow stream and it reduces the water and foam employment."

In all tests done, the aerosol turbine showed a higher efficiency both for gas absorption and for firefighting applications. After the testing phase, the turbine was introduced into the market under the name of AIRCORE, in cooperation with the German firetruck body builder Magirus, as a mobile concept on firefighting trucks as well as on remote controlled unmanned units.

Delegates also listened to a presentation entitled "Advanced fully automatic fire detection and extinguishing systems utilising robotic nozzles" delivered by Roger James, Director of International Sales & Marketing of Unifire AB of Sweden who announced the arrival of the FlameRanger XT - a new, fully automatic fire detection and extinguishing system designed specifically for fire protection of high-rise building exteriors.

According to Unifire, the system rapidly (typically in under 10 seconds) detects the presence of any fire on the exterior of a building, locates its size and 3D position, and immediately responds by suppressing the fire with a high volume of water delivered precisely onto the fire by means of an advanced robotic nozzle.

The FlameRanger XT uses two Tyco FV300 IR array flame detectors mounted on the building's façade to automatically detect and locate the exact size and 3D position of fire. The system then extends a highly-advanced robotic nozzle out of the



"Making fire protection less expensive and more effective."

building and accurately aims it at the fire and opens the valve to commence suppression. The system automatically shuts off the water as soon as the fire is extinguished, yet remains in active stand-by 24/7/365. By applying water only to the fire itself, and then shutting off when the fire is out, the system requires a bare minimum use of water.

In multiple, full-scale fire tests conducted by the U.S. Naval Research Laboratory and Jensen Hughes, a fixed mounted FlameRanger system extinguished all fires in 20 seconds or less from ignition, using less than 300 litres of water.

"A unique aspect of this technology is the fact that an unlimited number of systems can be networked, and all systems can be constantly remotely monitored and controlled via Unifire's InterAct™ graphical user interface (GUI)," explained Roger James.

Unifire also makes a version of the FlameRanger for large interior spaces and fixed installations, which can supplement water mist systems where the volume is too large for typical water mist applications.

IWMA General Manager Bettina McDowell says: "The issue with high-rise buildings is the amount of water that has to be pumped up. Here, complementary systems – both using a relatively small amount of water, one providing protection from the outside, the other from the inside – make fire protection less expensive and more effective."