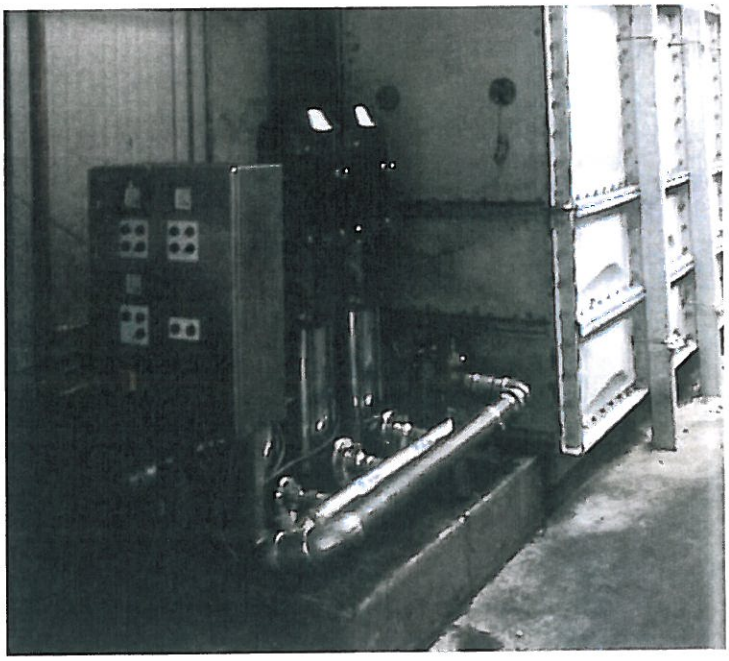
Tried & tested



A factory that installed a low-pressure water-mist system in its warehouse two years ago has since successfully prevented disaster not once but twice, writes Andy Cooke.

Westland Horticulture was seeking to protect a building that stored a low value organic filler that was known to spontaneously combust or catch fire via external means such as vehicle exhausts, arson, component failure and augur bearings overheating.

The client was already aware of water mist technology, having installed in 2010 a high-pressure system in its main factory as an alternative to a sprinkler solution; another HPWM system was installed in the sorting bins area the following year. These solutions, approved by the insurer, had been selected because water mist uses smaller pipes and requires less stored water and building work.

The site for the latest system was a wood fibre processing and mixing plant with associated offices and outbuildings operating on a 24/7 basis. A fire had previously occurred in the area and, on that occasion, the engineering manager was fortunate to receive a call from a neighbour informing him that smoke was emanating from one of his buildings. On arrival at the site he used a fire hose reel to douse the fire until the fire service turned up and extinguished the fire, saving the building and machinery it contained.

The loss of the building and attached plant could have halted the £150-million (US$200 million) company, or at least enabled its competitors to gain higher market share.

The site presented a number of challenges. First was the size of the area to be protected, a building 12 metres wide, 60 metres long and 14 metres high. Second was the fact the site actually had very limited spare space and was 'land locked', so the solution had to have a very small footprint as regards the system pumpset and fire water tank storage.

Working closely with the water-mist system manufacturer VID Fire-Kill and its UK director Dean Reeve, Xcell Misting developed an automatic low-pressure water mist system for the protection of the entire storage area and manufacturing facility.

The solution came in the form of VID Fire-Kill's 2V modular deluge Fleet Suppression System, which has been specifically designed for the zoned protection of industrial conveyors. It has been successfully full-scale tested in accordance with several standards, and is approved for the protection of closed, semi-closed and open conveyors transporting clean wood residue, coal or wood pellets.

The site was divided into six zones with an assumption of three zones being able to operate simultaneously at 203 lpm per zone, and a minimum pressure of 4 bar at all nozzles.

Each zone has a feeder pipe that runs along the long side of the structure. At the location of the area to be protected, it turns 90° up to the central apex of the ceiling and then splits into two at 90° to feed two nozzle pipes on each side. The spacing between nozzles on the two parallel nozzle pipes is short, as each 6m length is fitted with 12 nozzles. The configuration results in a fine and even distribution of water mist but without an increase in the cost for fittings and works; it also uses large-diameter nozzle orifices to reduce the possibility of clogging.

As the design enables the simultaneous supply of water to any three zones of the six installed, it allows for smaller pumps, less volume of stored water (22,000 litres); and, in the event of fire, the whole zone can be operated along with the two neighbouring zones if the fire tries to spread. It also only needs two full-duty pumps, one pump for pressure maintenance, and six control valves. The system is actuated by a Kentec addressable panel that controls the IR3 flame detectors on a 24-volt monitored power supply. The detectors are carefully addressed so they monitor their zone only.

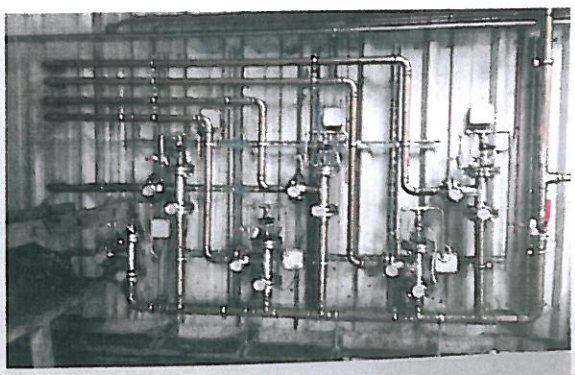
The system, which was commissioned after two full discharge tests, proceeded to successfully extinguish a fire not once but twice within a few months of its installation.

The first fire was caused by an overheated bearing igniting material on the auger, which then dropped onto a pile. On the second occasion, a vehicle exhaust system ignited material underneath it. In both instances the fires were detected and extinguished at an early stage, with no intervention required by the responding fire brigades.

Interestingly, both these fire scenarios had been discussed in early planning meetings by all parties, including the site operatives. Their input was key to the success of the implementation because they knew where the key fire issues were and how their business needed to integrate with the suppression system.

The finished design is now a standard set-up and we have just completed another installation for Westland Horticulture, this time in a 216m^3 area, with a one-shot full discharge in the event of fire. The company is now 100% a believer in water-mist technologies.

Andy Cooke is operations and technical director at Xcell Misting



The system consists of six control valves and two full-duty pumps (plus one for pressure maintenance).