



After a nitrogen pressurised foam suppression system was deemed too costly to maintain, engineers have implemented a mist suppression system at a museum in Darwin, as the lead article reveals. In other articles, a bushfire simulator has tested sustainable building materials, and Engineers Australia's Society of Fire Safety national president Elissa Fazio reports from a conference in Singapore.

Mist suppression for museum

A high pressure water mist suppression system has been commissioned in the Northern Territory Museum wet store, where thousands of animal specimens are preserved in ethanol solution.

The wet store located at Bullocky Point, Darwin, contains approximately 75kL of ethanol by volume and presents a significant fire risk. It is a separate 500m² building from the museum itself, and was purpose built in 2001 for the storage of small historical animal specimens. The specimens are preserved in glass jars in a 70% ethanol solution, and stored in compactus shelving. The store is restricted and not for public access and is fitted with intrinsically safe electrical fittings.

The original fire protection system was based on nitrogen pressurised foam suppression which the museum said required costly maintenance and clean up from false alarms. The museum was keen to explore different systems for meeting the unique challenges faced with the storage, its operation and location.

BCA Engineers was engaged by the Northern Territory Department of Con-

struction and Infrastructure to design and certify the installation of a new fire protection system. The agreed construction value was \$1 million.

BCA Engineers selected a high pressure water mist suppression system.

"One of the key selection reasons was the suppression medium (water) required no special additives or gases and was suitable for town water supply in Darwin," BCA Engineers director Nathan Brown said.

Also, he explained, a high pressure water mist system produces very small

water particles (50-120um) – essentially a fog that is very effective in quickly extinguishing a fast developing fire. The system has been designed to impact an ethanol fire by saturating the air, cooling the fire and reducing the heat.

Brown said: "Water mist systems smother the fire from the combustion process rather than conventional sprinklers which have to wet the fire and the surrounding combustibles."

Chubb Fire won the construction contract using the Marioff Hi-Fog water mist suppression system, arranged as two mist

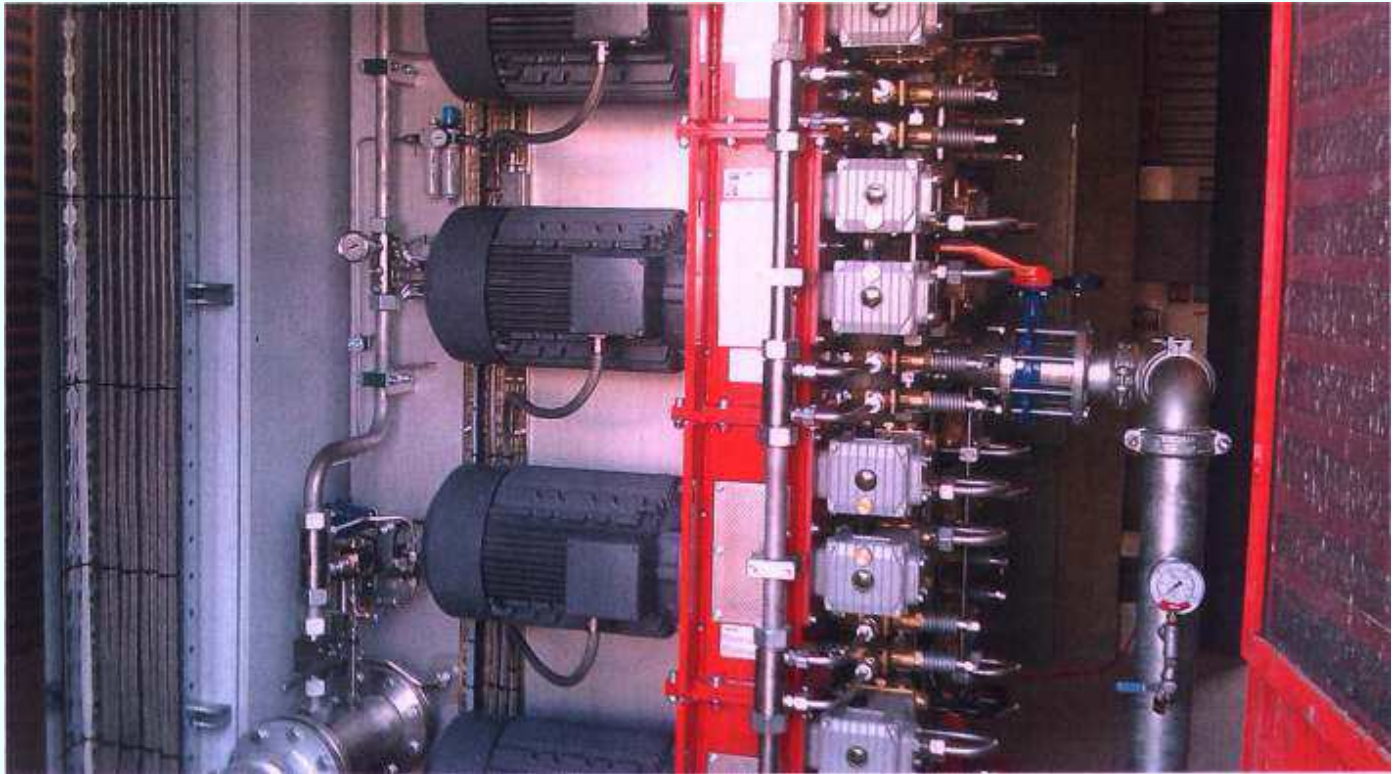
zones. Flame detection is used to activate the system automatically.

BCA Engineers principal fire engineer Koroush Keshavarz said the system comprises a deluge water mist system discharging town water throughout the protected space. High pressure nozzles and distribution piping serves the risk area at ceiling level. The water supply to the system is provided from a dedicated 25kL storage tank and booster pump with a full flow bypass arranged from the museum's site fire water supply infrastructure.

"An eight-stage high-pressure pump skid pressurises the system to approximately 14MPa," Keshavarz explained. "The electrical demands of the pump required a new 400A dedicated supply from the museum's essential supply. The system is designed to load shed the museum's air conditioning chillers on the emergency generator supply to avoid overloading in the event of a power failure, which is common in Darwin's wet season."

The project commenced in late 2009 and was completed last December. Keshavarz said it is the largest system of its type in Australia.





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