AP SENSING.

Al Rayyan Cable Tunnel Protection
Doha, State of Qatar

Project Overview

In one of Qatar's recent projects, newly built highways were developed in order to ease traffic congestion. Part of this project included the construction of several electrical cable tunnels for Ashghal (the Public Works Authority of Qatar). These tunnels, located by a major road, are difficult to access and therefore difficult to monitor. The client required a reliable solution for fire detection along the tunnels. This solution must function alongside other monitoring technologies and interface with the local Fire Alarm Control Panel (FACP). A simple AP Sensing fiber optic Linear Heat Detection (LHD) solution was selected by the customer and installed by our local partner NAFFCO. The project was commissioned in stages, and some of these tunnels have now been protected with fiber optic LHD since 2016.

Solution

To date, six LHD interrogator units have been installed along a distance of 7 km in order to protect different cable tunnels located between the district of Al Rayyan and the capital city Doha. Due to the dispersed nature of the Ashghal cable tunnels, several short range LHD units are required to provide fire detection capabilities at each cable tunnel. Electrical cables with 11 and 33 kV are deployed at cable galleries and racks. Each cable tunnel requires an independent, short-range LHD unit, and every LHD unit interfaces to

the local FACP with voltage-free relay contacts. The cable was routed simply along each tunnel using pre-fitted cable clamps located at the crown of each cable tunnel.

⚙ Background

- New infrastructure projects in the state of Qatar involved the construction of new electrical cable tunnels
- Important to protect all of these cable tunnels with reliable and robust fire protection
- These tunnels are difficult to access and therefore require a system that is easy to install

⊞ Solution & Benefits

- Six LHD interrogator units, each with battery backup in case of a power supply interruption
- Each LHD unit interfaces to the local FACP
- 24/7 real-time monitoring data

THINKING AHEAD
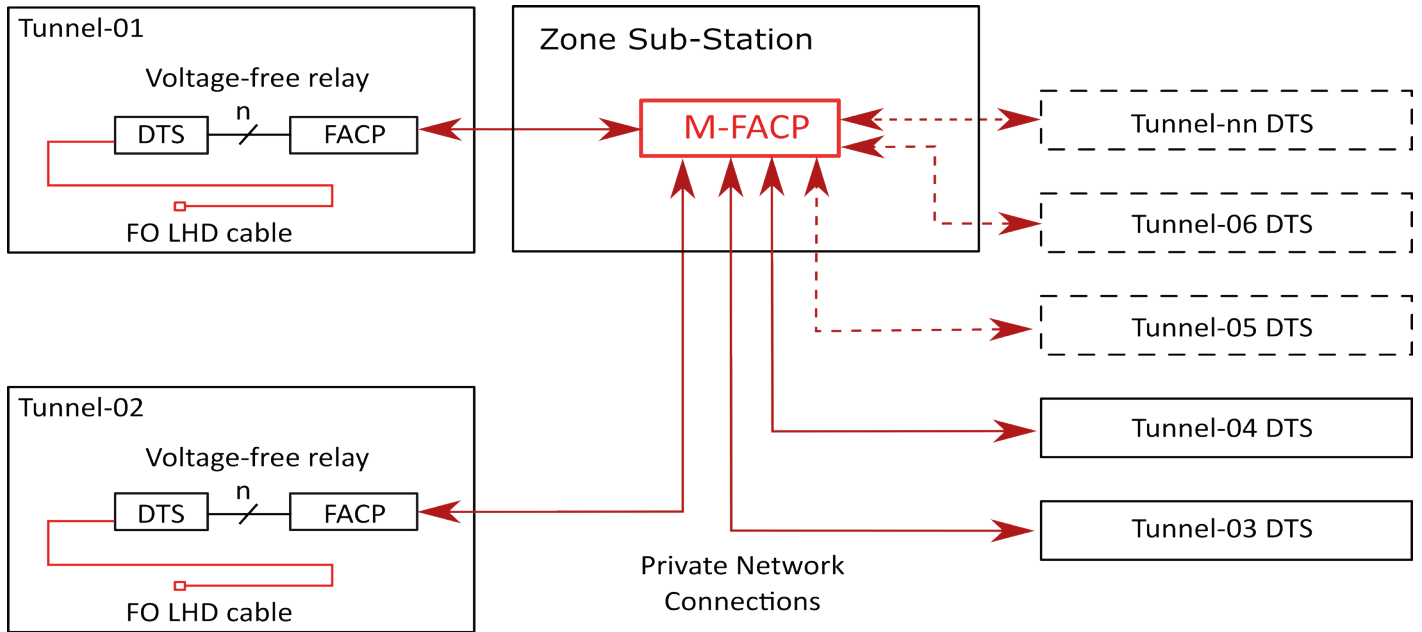
Each LHD unit has a wall mounted enclosure for easy installation on a vertical wall. In the event of a power supply interruption, each LHD unit also has a battery backup unit that ensures uninterrupted fire detection and monitoring.

Across the district, each local FACP system communicates to the master FACP over a private network. With the master one located centrally at an electricity substation, it facilitates easy access for Ashghal to efficiently monitor and handle fire alarm signals. The LHD interrogators are wall-mounted next to each local FACP, signaling alarm and system statuses directly via integrated voltage-free relay contacts.

Benefits

AP Sensing's solution is ideal for electrical cable tunnels as the cable itself is small, lightweight and easy to install – fitting the twists and turns of a tunnel. As the project location is typically hot and humid year-round, engineering reliability was also a requirement.

Each cable tunnel has been divided into individual fire detection zones, enabling the LHD to report the accurate location of a fire event to the FACP in real time. The systems were configured appropriately to ensure compliance to UL 521 and FM 3210 regulations.

During the design of the fire protection system, the volume of cable trays and quantity of electrical cables was considered.

AP Sensing's system for this project was designed to scale upwards and match the future growth of the Ashghal electrical distribution network with additional range or channels added to the installed LHD devices. Additionally, the LHD system is designed so that the preexisting Modbus communication can be configured in the future.

Beyond commissioning and handing over the operational system to Ashghal, our local partner NAFFCO works with the customer to provide maintenance and rapid response service, ensuring that the LHD system is operating at peak performance.

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