



## 66 kV Transmission Substation Protection

Singapore

### Project Overview

In one of Singapore's Linear Heat Detection projects, old substations were upgraded from a conventional heat detection system to a new linear heat detection system. Part of this project included the construction of several conventional fire alarm detection systems to addressable detection systems.

The client required a reliable solution for fire detection along the substations. This solution must function along with other monitoring technologies and additionally interface with the local Fire Alarm Control Panel (FACP).

An AP Sensing fiber optic Linear Heat Detection (LHD) solution was selected by the customer and then installed by our local partner. This project was commissioned in stages, coming to a conclusion in 2022 when some of the substations were protected with fiber optic LHD.

### Solution

To date, five LHD interrogator units have been installed along a distance of 1 km in order to protect various substations.

Each 22 & 66 kV transformer room including Low Voltage(LV)transformer rooms,andsprinklerpumprooms,

were required to protect using Linear Heat Detection.

Each substation required an independent, short-range LHD unit, each unit interfacing to the local FACP using voltage-free relay contacts.

### Background

- Existing Substations are required to upgrades from a conventional to a new addressable fire alarm system including Linear Heat Detection (LHD)
- Protection of rooms with reliable and robust fire protection
- Each existing substation is operational, requiring easy system installation

### Solution & Benefits

- Five LHD interrogator units, each with battery backup in case of power supply interruption
- Each LHD unit interfaces to the Fire Alarm Control Panel
- 24/7 real-time monitoring data



The flexible sensor cable was routed easily along each room using stainless steel cable clamps for each substation. Each LHD unit contains a wall mounted enclosure for easy installation on a vertical wall. In the event of a power supply interruption, each LHD unit has a battery backup unit that ensures uninterrupted fire detection and monitoring.

The LHD interrogators are wallmounted next to each Local Fire Alarm Control Panel, signaling every alarm and system status directly via integrated voltage-free relay contacts.

## Benefits

AP Sensing's LHD solution is perfect for fire detection in electrical substations. The  $\varnothing$  4 mm sensor cable is small, lightweight, immune to electromagnetic interference (EMI), and maintenance-free. It is easy to install, seamlessly fitting into the twists and turns of a building, including retrofit projects.

Given the project's environment which is typically dense and tropical year-round, robustness and engineering reliability was also a requirement.

Each substation room 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.

## Fiber Optic LHD Advantages

Why Choose AP Sensing's Fiber Optic LHD System for Substations?

- Immunity to electromagnetic interference (EMI), ensuring no signal interference occurs
- Our full set of fire certifications including UL, FM, VdS
- MTBF of >33 years with the lowest failure rates in the industry.
- Industry standard interface (Modbus) and relays for easy integration with SCADA and Fire Alarm Control Panel
- Fire monitoring capabilities: a system that can report temperatures up to 750°C, in order to effectively gain control over fires and activate countermeasures in emergency situations

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

