MMC-GAMUDA KVMRT 275KV POWER CABLE MONITORING & LINEAR HEAT DETECTION AT TNB PMU PUDU ULU STATION, KUALA LUMPUR, MALAYSIA

Fig. 1: Power cable and fibre optic cable in Underground Tunnel

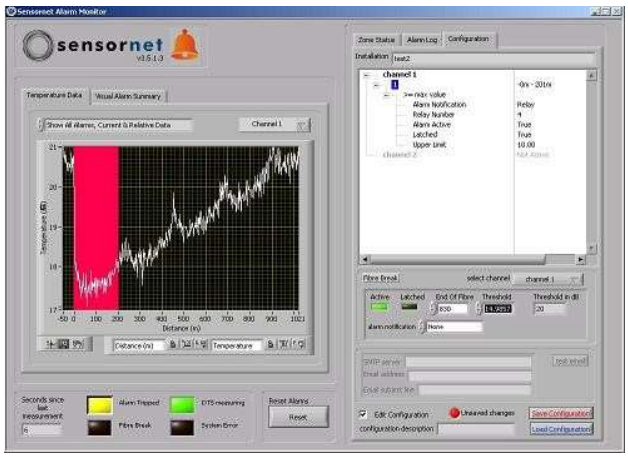

Fig. 2: The multichannel Halo™ DTS displays real time temperature and alarm conditions displayed as bars. Alarm conditions are also relayed to the substation SCADA system

THE PROJECT

Project Owner: MRT Corp
EPC Contractor: MMC-Gamuda
Authority : Tenaga Nasional Berhad (TNB)

SCOPE OF WORK

Sensornet supplied a Fibre Optic cable monitoring and linear heat detection system for the three phase dual circuit power cables installed in the power tunnel of the metropolitan railway transport company (MRT). The power supply system is managed by the National Electricity Company (TNB) in the heart of the Kuala Lumpur metropolis.

Fig. 3: Cable section and junction box inside PMU Building

The cable circuitry consists of three phase dual circuit cables and the Sensornet Halo™ DTS system was set up to monitor the temperature of the underground cable section for MRT. All three phases of the power circuits are monitored using external fibre optic sensing cables installed in the same ducts as the power cables.

The 4km Halo™ DTS unit located within the control room of the substation sufficiently monitors the underground cable section and was configured in a loop configuration (as shown in figure 4 below) to provide resilience in the measurement path.

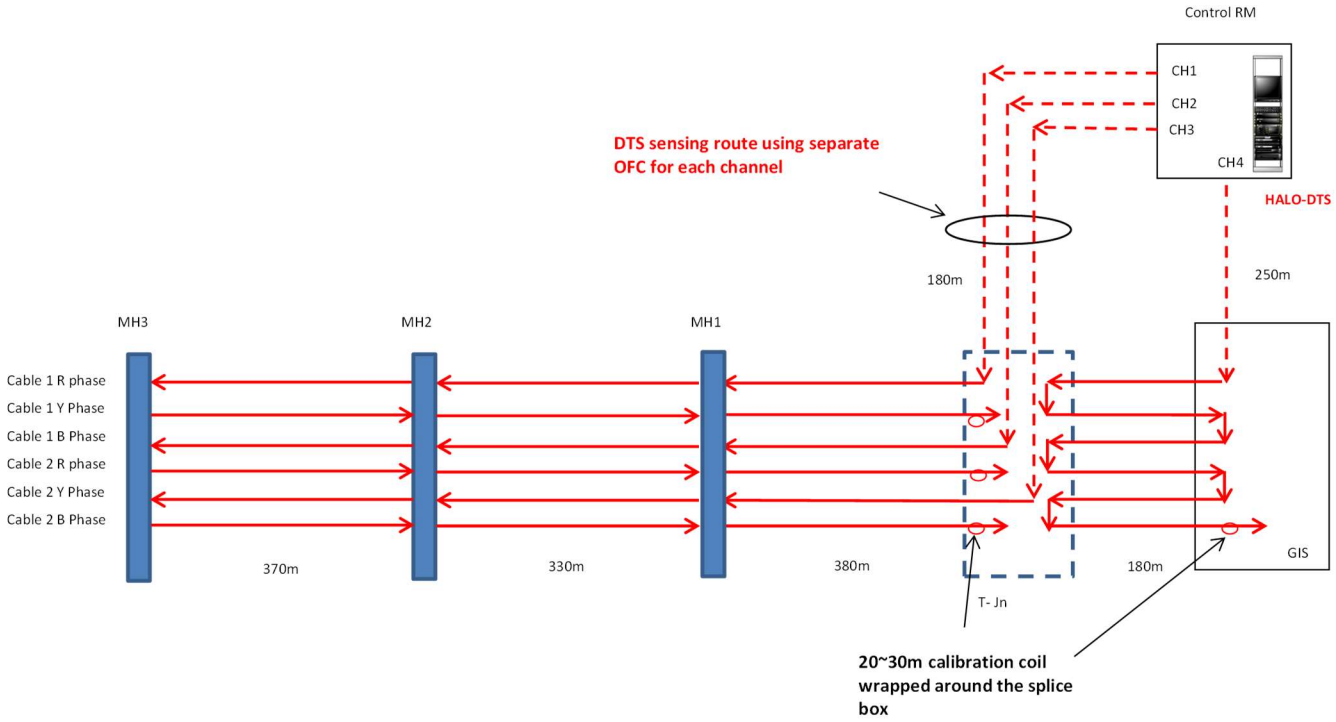

Fig. 4: Underground section of fibre optic DTS sensing cable loop configuration

BENEFITS TO THE CLIENT

The primary function of the Sensornet fibre optic linear heat detection system is to monitor the 275kV dual circuit power supply cables for hot spots and initiate an alarm at elevated temperatures above pre-defined thresholds.

Additionally, the system functions as linear heat detectors, transmitting temperature measurements at a spatial resolution of 2 meters to the substation Fire & Gas System (FGS) in real time, with the benefit of providing asset integrity monitoring to the customer.

The full benefits of Sensornet's Linear Heat Detection system usually include:

- Hot spot and fault detection, locating hotspots to within 2m
- Network optimisation with the combination of DTS and Real Time Temperature Rating (RTTR)
- Asset lifetime calculations from actual thermal stress information using DTS and RTTR