Underground Power Cable Monitoring
Latvia

In 2017, an AP Sensing fiber-optic DTS (Distributed Temperature Sensing) solution was selected to monitor power cables on two underground circuits in Riga.

The Challenge

The Latvian power utility was building a new substation in Skanste Riga. AP Sensing was selected as a proven and reliable solution to protect the related power network and monitor its temperature in high load situations. The power cables form two independent 110kV underground circuits within Riga, running 4km and 3km each. The installation involved one DTS N4425A device with six channels.

New substation in Riga

RTTR

The installation was further enhanced with AP Sensing's RTTR (real time thermal rating) engine. RTTR continuously calculates the conductor temperature and predicts the maximum permissible load for steady state and emergency conditions. RTTR was used to calculate the conductor temperature based on five different thermal sections.

Operation of a DTS unit in a rack

SmartVision™

In addition, this project utilized our SmartVision™ information management suite. SmartVision™ provides a graphic overview of all temperature information. It automatically detects hotspot locations and provides alarms if critical limits are exceeded. SmartVision™ records and displays not only temperature readings, but also rating information, steady ampacity and emergency ratings.

In this project, load values are obtained from SCADA by SmartVision™ via the standard protocol IEC 61850. Utilizing this information, the relay outputs from the multi-sensor board provide power failures, system faults, fiber breaks, and data processing errors back to SCADA. Furthermore, data such as temperature alarms, hotspots, and system failures get transferred from SmartVision to SCADA via IEC 61850 for each circuit.
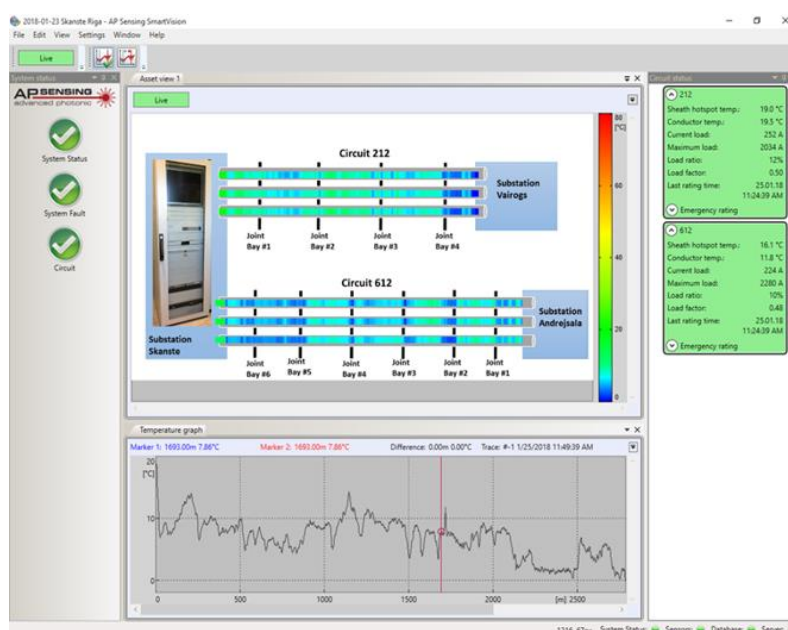
SmartVision™ asset visualization with IEC 61850 configurable box

Leading the Way with Passion.