Case Study: LambdaDriver® Enables Nationwide WDM Smart Utility Grid in EMEA

CUSTOMER PROFILE

The power utility company is one of the most prominent electricity transmission grid operators in Europe and among the 10 in the world for kilometers of electricity lines managed. The utility grid operator is responsible for energy transmission and dispatching throughout the national territory.

The utility grid operator has been developing new businesses, both domestically and abroad, aiming at expanding business opportunities deriving from trends characterizing the energy sector such as: renewables growth, developing Smart Grids, energy efficiency.

SERVICE(S) OFFERED BY THE CUSTOMER

The services provided by the power utility company are essential for the operation of the entire electricity system and for guaranteeing electricity supply to the entire national community including residential customers and businesses.

The company is responsible for HV (High Voltage) and Extra HV electricity transmission. Transmitting energy means transferring the electricity produced from the production plants to the consumption areas. To this purpose, lines and transforming stations including transforming substations (RTUs - Remote Terminal Units) are needed: the elements which form the Transmission Grid, the “backbone” of the country electricity system.

The company safely manages the nationwide transmission grid with 12,000 km of HV electricity lines and has the responsibility, 365 days a year, 24 hours a day, of electricity transmission and dispatching, safely managing the balance between electricity demand and supply nationwide.

Application Challenges

- Provide remote access, central control & management of transforming sub-stations in critical power plant infrastructure
- Provide smart, reliable, and low-latency monitoring to ensure rapid backup switchover in a case of a transforming sub-station/power plant power failure so residential and business customers are served without interruption
- Provide DWDM network over OPGW aerial fibers (optical fiber composite overhead ground wire) that are much more challenging to implement from the physical perspective

Solution Benefits

- High-availability solution that provide remote access, control, and management of transforming sub-stations in critical power plant infrastructure
- Provides smart, reliable, and low-latency monitoring solution that ensuring power grid operates smoothly and consequently entire national community is served without interruption
- Increased reliability for electricity restoration via automatic power reroute that minimize the effect of an outage with no operator intervention
- LambdaDriver nodes create a foundation for future Metro and national DWDM dark fiber backbone for the power utility company enterprise customers
MRV SOLUTIONS

MRV’s solution comprises of the LambdaDriver® (LD), intelligent WDM and Optical Transport system along with Megavision-Pro Network Management & Control system. MRV and the power utility company have designed and deployed 14 regional WDM rings over 12,000 km of fiber that are collapsed to a virtual core ring and connecting to a Central Office (CO) Network Operation Center (NOC) – see network diagram below.

Each transforming sub-station node (total of more than 200 RTU nodes & 10’s amplification sites for hundreds of locations) of a regional WDM ring includes a redundant LambdaDriver system that provides 2 x Gigabit Ethernet router interconnects per transforming sub-station. The LD is responsible for the access, control, and management of transforming sub-stations. The LD system enables smart, reliable, and low-latency monitoring for rapid backup switchover in a case of a power failure in the transforming sub-station, thus ensuring that residential and business customers are served without interruption. The control and management system collects the monitoring information from the regional WDM rings and their LD/router nodes so switchover decisions are executed in real time ensuring smooth electricity supply through the entire power utility network which results in increased reliability via automatic power reroute that minimizes the effect of an outage.

Why MRV?

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Nationwide WDM Backbone Network

Why MRV?

MrV operates worldwide sales and service offices across four continents.

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