ABB Power Systems: Infrastructure enhancement reduces risk of blackouts

The new Estlink connection links the power grids in the Nordic and Baltic states. With the cross-border power supply line running through the depths of the Baltic Sea, the EU aims to minimize the risk of blackouts. In addition to increasing the reliability of the European power grid, the transnational power cable also aims to promote the formation of a more efficient European energy market. The underground power cable is monitored with the aid of I/O technology from Beckhoff.

Underground power cable connects Finland and Estonia grids

The power connection with a total length of 105 km (65 miles) between the city of Espoo, Finland, near Helsinki and the Harku area of Tallinn in Estonia was developed and built by ABB Power Systems, based in Ludvika, Sweden. The link includes two cables that are laid underground over the whole length. The underwater Baltic Sea crossing has a length of 74 km (46 miles). The new link is operated by Nordic Energy Link, an association of Finnish and Baltic power supply companies.

The Estlink connection feeds electricity from the Baltic states into the Scandinavian market. With a capacity of 350 MW, the underground link safeguards against potential power shortages in the Scandinavian region and is intended to prevent massive power grid failures previously experienced in America and also in Europe.

The Estlink connection, which was commissioned at the end of 2006, is based on HVDC Light®, a high-voltage DC transmission technology. The advantages of HVDC Light® technology are secure control of current flow and fast restoration of power supply in the event of a fault. HVDC Light® is an environmentally-friendly technology using only oil-free cables. The power transmission generates no electromagnetic fields.

ABB was responsible for the production of the cables and for the construction of the compact converter stations. The Beckhoff Bus Terminal system is used for process monitoring in the converter stations. For example, PT100 resistance sen-
HVDC Light® (high-voltage DC transmission) is the only technology enabling underground high-voltage transmission over a long distance. The world’s longest underground power link, the 177 km (110 mile) connection between the Australian states of Victoria and South Australia, is also based on this technology.

“...s in combination with KL3202 analog input terminals monitor the cable surface temperature, which shows the actual load case of the cable connection. “We chose the Beckhoff Bus Terminals, because they provide a cost effective way to connect distributed in- and output signals in the converter stations”, said Hans Björklund, Company Senior Specialist at ABB Power Systems HVDC. Similar solutions are used to control and monitor the water and air cooling systems of critical components in the converter stations like IGBT valves and phase reactors. Bus Couplers with a CANopen interface connect the I/O stations to the higher-level network.