The more electricity people consume, the more pressure on electrical utilities to provide a reliable, uninterrupted supply of electricity. Utilities now commonly measure the number and duration of interruptions in their systems in order to compare the performance reliability of electrical networks and justify the investments to regulatory authorities.

The performance reliability of distribution networks depends on network infrastructure, which is why the Hungarian power utility ELMŰ-ÉMÁSZ Group, a subsidiary of the European energy conglomerate RWE, asked ABB, the world’s leading supplier of products, systems and services for the efficient transmission and distribution of electricity, to upgrade and automate its medium voltage power distribution network.

Customer need
Budapesti Elektromos Művek (ELMŰ) and Észak-magyarországi Ármsgolágtató (ÉMÁSZ) has operated for more than a century with the goal of providing customers with reliable, high-quality power in the capital, Budapest, and Northern-Hungary.

Outage data is captured in a power network’s System Average Interruption Frequency Index (SAIFI), which measures the average frequency of interruptions in power supply, and the System Average Interruption Duration Index (SAIDI), which shows the average length of time power is interrupted in minutes per customer.

ELMŰ-ÉMÁSZ decided it could reduce the number and duration of power interruptions in its distribution network with an automated system that reliably detects faults, and enables operators to remotely control primary apparatus, pole mounted switches and secondary substations in order to speed up reaction times when interruptions occur.

The customer wanted to distribute remote control cubicles across its network fitted with directional fault detection features, as well conventional current transformer and voltage sensor inputs.

The ABB solution
ABB delivered a cost-effective, tailor-made solution that fits all of the customer’s specific needs due to outdated existing infrastructure and modern technologies utilized. It includes monitoring and control of pole-top overhead line switches and Secondary Substations via ABB RTU520 series remote terminal units (RTUs); providing fault detection and directional information to help locate faults by means of current/voltage measurement information via sensor and conventional transformer inputs, all in one device; communications based on IEC870-5-104 via the public GPRS network to the DMS system; and UPS battery backup.

GRID AUTOMATION PRODUCTS

RTU500 series delivers a customized power reliability solution in Hungary.

01 More than 300 of pole top mounted switches were equipped with remote control and monitoring capabilities.
ABB's modular RTU500 solution met the communication and remote control specifications, but had to be adapted to create a product not yet available on the market. The RTUs were altered at the ABB factory according to customer specifications to create a type of multimeter that combines directional fault detection with conventional current transformer and voltage sensor inputs, and fits into a standardized cubicle.

ABB has been contracted to design, engineer and manufactured about 500 of these tailor-made remote control cubicles for ELMŰ distribution network, all based on its RTU520 remote terminal unit.

Customer benefits
The projected involved collaboration between ABB units in Germany, which supplied products and project specific adaptions, and Hungary, which engineered the system solution, did the panel design and manufactured the cubicle.

The ABB RTU520 provides a highly customizable design, and enables input and output module adaptions specific to unique application requirements. The unit’s efficient footprint helps it fit into small control cabinets, and provides a customizable product solution that can adapt quickly and easily to changing requirements.

The ABB solution is designed to operate maintenance-free for more than 20 years, provides a flexible, open platform to accommodate a future smart grid, and has reduced both the frequency and duration of power interruptions in ELMŰ's distribution network.