Weaving a power control web for the Underground

An integrated, high performance SCADA SPIDER system is helping London Underground to improve the efficiency of its power network.

The Background
One of ABB’s main roles in the EDF Energy Powerlink PFI (Private Finance Initiative) consortium, in which ABB is a partner with EDF Energy and Balfour Beatty, has been the design, installation and commissioning of a new integrated, high performance, SCADA SPIDER system for the London Underground (LU). This provides overall control of the power distribution network for four out of seven LU regions (Eastern, Western, Victoria and Metropolitan) as well as the primary 22kV distribution network. It replaces six previous SCADA systems.

The Response
The SPIDER SCADA system is fully integrated with LU’s communications system. Control of the network is centralised in two replicated command centres (main and emergency), with dual application servers interconnected by a high-speed fibre-optic communications link.

RTUs (Remote Terminal Units) provide the local interface with the power network equipment (transformers, switchgear, SVCs and so on), and they are linked into the SCADA system by copper lines converging on six data concentrators. One of the key technical challenges in the project was in developing the protocol conversion software that enabled the legacy RTUs to communicate with the new SCADA system.

The Verdict
Since commissioning was completed in 2006, the SPIDER system has proved its capability to ensure a high level of power availability to meet LU’s stringent operating targets. In particular, greater visibility of the power system enables any issue to be flagged and identified, so that early action can be taken to prevent it escalating into a fault.

ABB has also provided five Static Var Compensators (SVCs) that control the voltage and provide greater stability in the power distribution grid.

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