

SUCCESS STORY

Relion® protection relays to London Underground London, United Kingdom



A modern and cost-efficient solution for reliable and secure power supply with dedicated busbar protection

Project at a glance

Customer: London Underground

Segment: Rail industry

ABB products: Relion® protection and control relays from the 611, 615, 620, 630 series (REB611, RED615, REF620, RET620, REF630), Gas-insulated switchgear ZX2, air-insulated switchgear UniGear ZS1, Protection and control IED manager PCM600.

Customer challenge

London Underground has initiated an extensive power upgrade program to meet increased demand and reliability for the power supply. The customer set up a new framework with terms and conditions for suppliers contributing to this power upgrade program, which includes strict technical requirements, a fixed budget and a challenging project schedule.

ABB solution

ABB solution is built on replacing the existing time-expired switchgear with ABB's primary air-insulated UniGear ZS1 and gas-insulated ZX2 switchgear. To ensure continued power supply ABB proposed an authentic IEC 61850 solution with full compatibility with other switchgear on the network and ease of integration into the London Underground SCADA (Supervisory Control and Data Acquisition) system.

ABB's high-performing solution is based on the compact and powerful protection and control functionality available when combining the leading-edge Relion protection relays and the modern primary medium-voltage switchgear.

To strengthen the solution and specifically protect the substation busbars, the cost-efficient and compact busbar protection relay REB611 was incorporated in the solution. The REB611 provides zoned protection and supervision of the busbar using high impedance-based principles. The protection relay solution also incorporates trip circuit supervision, lock-out and watchdog contacts, thus removing the need for any additional auxiliary relays.

The high performance of this solution is achieved thanks to the compatibility and flexibility of all the devices used. The solution is built on the IEC 61850 standard for power system automation to ensure power system reliability and performance. The solution is practically free of wiring costs, with all the information needed available in the IEC 61850 network.



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01 The Relion®
protection relay series
used in the project

With this modernization of the substation, the customer installs modern digital protection relays, which provide abundantly more information to SCADA systems compared to the previous generations of protection relays. Benefits with digital relays also include dynamic change of settings, easier calibration and allowing for complex protection relay schemes to be built.

Customer benefits

- Successful execution within budget
- Compact modern protection relays with integrated functionality that require less panel space and easier maintenance and dynamic change of settings
- High-impedance numerical zoned busbar protection
- Reduced interconnection wiring
- Withdrawable plug-in design of the relays offers very short MTTR (mean time to repair) should there be any failures or damaged units, which is essential on a network that is running 24/7
- The withdrawable plug-in design also allows keeping the sensitive electrical equipment safe and clean during the switchgear installation. The relays can be inserted later, when the construction work has finished.

About the project

London Underground is making significant investments into upgrading the overall power supply to support the introduction of 191 new air-conditioned trains and provide more frequent and reliable passenger services and greatly improved accessibility on the Circle, District, Hammersmith & City and Metropolitan Lines.

As one of the key parts of this initiative, ABB delivers medium-voltage switchgear to upgrade the 11 and 22 kilovolt (kV) power networks serving London Underground's sub-surface railway (SSR) lines.

For more information, please contact

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