Substation Automation Systems

With the rapid growth of Intelligent Electronic Devices (IEDs) that monitor, control and protect substation equipment, there is an increased demand for cost-effective and integrated automation systems.

Since the early 2000s, we have established ourselves as a world-class consulting integrator of substation automation systems. We provide design solutions to distribution systems below 25kV and transmission systems up to 500kV. We also retrofit and replace aging platforms with the latest technology available from conceptual design to commissioning stages.

Our Expertise in Substation Automation Systems

Our field of expertise includes the study, conceptual design, specifications and implementation of a variety of substation IEDs, such as Remote Terminal Units (RTUs) for traditional SCADA systems, data gateways, Human Machine Interface (HMI), communication systems, firewalls, merging units and bay control units.

Our team of highly experienced substation automation specialists is supported by our network of industry experts. Our skilled project delivery team provides complete power grid design solutions. Using the highest level of expertise in technology and project delivery ensures that the power systems we design and construct perform optimally, ensuring the complete integration of complex technologies in the power grid.

Our Services

We deliver a full suite of substation automation solutions that includes feasibility studies, design studies, proposal packages, technical evaluation of tenders, owner’s engineering, detailed specifications, detailed engineering, installation and commissioning. We also offer design interface solutions for protection and control (P&C) and telecommunications requirements.

Our team can deliver the technical scope for substation automation projects, including:

- System architecture for conventional systems and IEC-61850 standards;
- Cyber security and NERC-CIP;
- Modernization of legacy equipment programs;
- Voltage-VAR Optimization (VVO) programs;
- Signals list definition and database management;
- Development of detailed ratings specifications;
- Development of communication system specifications;
- Development of communication protocol specifications;
- IED configuration settings;
- Supervision of final commissioning and acceptance tests on site.

End-to-End Solutions

- Capital
- Engineering
- Procurement
- Construction
- Operations & Maintenance
Key Projects

We are a Tier-1 service provider of substation automation solutions in Canada. Our core team has successfully designed, retrofitted and commissioned automation systems for over 300 substations in Alberta and over 200 substations in British Columbia. The integral knowledge gained from building these systems allows us to understand and challenge the limits of these technologies, and to design the best options for our client.

A firm example of this expertise was our role in working with client BC Hydro to optimize the control building footprint by providing a scalable and robust control system that meets the substation’s ultimate capacity. By providing the future rack layout and equipment selection in the early design stages, our client was able to plug in the prescribed modules with minimal re-integration at a later date.

Find out more about our projects at www.snclavalin.com/projects

Keewatinohk
Canada
› EPC services for a 230-kV AC nine-bay switchyard within the Keewatinohk converter station
› IEC-61850 compliant substation automation and protection with integration to HVDC vendor
› NERC-CIP compliant

Western Alberta Transmission Line
Canada
› EPC services for two 1000-MW, 500-kV monopole HVDC converter stations (with STATCOM on one facility)
› Seamless integration of substation automation across HVDC control systems, STATCOM and AC control systems
› Redundant automation equipment over a dual-star communication network for added system resiliency

Horsey Substation
Canada
› EPC services for modernization of a 230-kV gas-insulated substation, replacement of aging breakers and addition of feeders
› Modernization of electro-mechanical relays and annunciation panels into microprocessor-based relays, automation controllers, and HMI over a distributed network

Dogtown Road SVC
USA
› Owner’s Engineering services for 0/+70 MVAR SVC at the Detroit Substation located in Maine and in association with the Blue Sky West Wind Farm
› Signals list definition assessment
› Control system architecture and communication network evaluation