

## IEC61850 Tool Accelerating Substation Modernization

### Client/Project Background

**Customer:**  
Major Power Distributor

**Region:**  
Australia

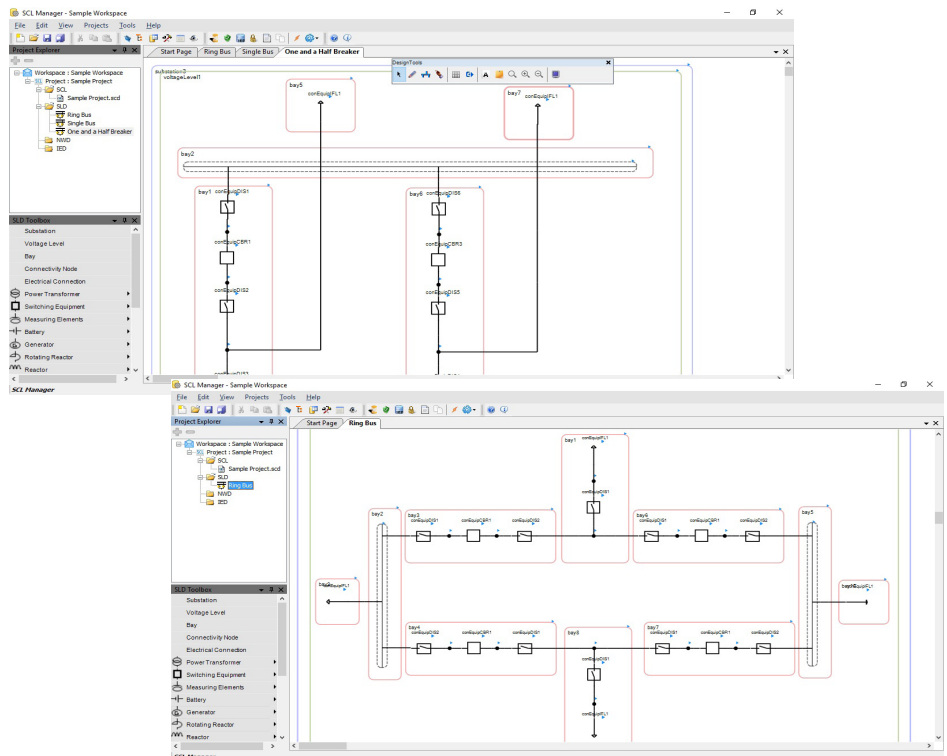
**Business:**  
Power Transmission and Distribution Utility

### Kalkitech Solution

SCL Manager (an application in the ASE61850 Suite)

### Challenge

During IEC 61850 planning, the utility was faced with the challenge of identifying a single tool that could be used for engineering, design, and implementation of substation automation solutions



Example Screenshots from SCL Manager

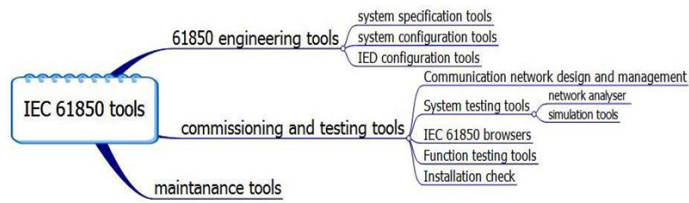
### Business Need

The customer is a major transmission utility with approximately 40,000 km of transmission and cables in an Oceania country. They provide power to distribution utilities and directly to major end users. The utility grid interconnects the northern and southern parts of the region, providing a robust electricity system that makes interstate energy trading possible. The transmission system serves the largest state in the market. The utility also manages substations and transmission lines using their own telecommunication network to maintain standards required by the Market Operator.

The customer identified the potential benefits of implementing IEC 61850 in its future substation designs, based on observing the successes the standard had achieved by utilities in Europe and Asia. A shift to a new protocol standard required an entirely new system design and tools. The utility wanted an engineering tool that would deliver compliance with the IEC 61850 standard in addition to:

- An IEC 61850 design tool to create, configure, view and edit substation elements
- Engineering and commissioning process independent of device software
- Test tool to identify, monitor and obtain GOOSE messages and reports
- Help in designing the IEC61850 communications network
- Extensibility to support extension/amendments to the IEC 61850 standard

The figure below summarizes the capabilities the utility sought in a single engineering tool. It encompasses design, engineering and commissioning of an IEC 61850 substation automation system. In addition, they wanted to ensure the tool would be able to scale and incorporate future enhancements as the IEC 61850 standard evolves.



The utility evaluated several IEC 61850 tools in the market, including, [ASE61850 Suite](#) which is comprised of three products (ASE61850 Communications Test Set, SCL Manager, and IED Smart) which can be purchased individually or as a combined package. The customer determined SCL Manager met their check list of requirements and conducted extensive interoperability and performance tests.

### Solution

SCL Manager met the customer's expectations in all the technical and performance tests. The flexibility of the software to accommodate future requirements like client server architecture, convinced the customer to select SCL Manager as the standard platform which the utility will utilize for engineering of IEC 61850 substations.

An additional ASE61850 Suite component, IED Smart, was evaluated and selected for the project IED Smart provides IED simulation capability for integration testing and engineering analysis.

The customer also selected Kalkitech to provide additional IEC 61850 related products (protocol converters, embedded modules) as well as IEC 61850 consulting and IEC 61850 training to help them complete their project.

Key features which lead utility to select Kalkitech solutions:

- Standard support for Edition 1 and 2
- Template availability for IED and SLD
- Wizards for step-by-step configuration of each section
- Support for released extensions like Hydro, DER and Wind
- Integrated test and engineering tools
- Flexible for adding future version, adding documentation templates, upgrading to a client server architecture
- Ability to easily add custom-built data models

The SCL Manager offers the following key features:

- Bind incoming signals to an IED
- Support for FCCB elements in datasets
- CID file creation
- Built-in library which supports edition 1 & 2 IED data models
- System configuration
- IED data model editing
- Define datasets and control blocks
- Multi-standard support (edition 1 & 2)
- Bay templates
- Edit/create IED communication & physical connection
- Import substation section from SCD/SSD
- Edit substation section
- Database for IED used in the project

IED Smart offers the following key features:

- Support for all Logical Nodes and Common Data Classes defined in IEC 61850 7-3 and 7-4 (IEC 61850 Edition 1 & Edition 2)
- Support for multiple IEDs simulations
  - Provision to attach Virtual/Real IPs to an IED
  - Provision to attach Network Interface to GOOSE and Sample Value
- Support for IEC 61850 8-1 communication models
  - Application Association
  - Server/Logical Device/Logical Node/Functional Constraint/
  - Data Attribute Models
  - Data Sets
  - Setting Group (SGCB)
  - Substitution
  - Reports (Buffered and Unbuffered)
  - Log Control
  - GOOSE Publisher
  - GOOSE Subscriber
  - Controls
  - Sampled Value Publisher (Minimal)
  - File Services
- Data simulation with millisecond accuracy
- Data simulation using user Interfaces like VB Scripts & time-based data changes