

## **TransGrid Substation Control and Monitoring**

### ***About the Customer***

TransGrid is the owner, operator and manager of the high voltage electricity transmission system throughout New South Wales (NSW), Australia. They transmit electricity across NSW through 12,016 kilometres of high voltage transmission lines. Their high voltage electricity system comprises 76 substations and power station switchyards.

### ***Our Challenge***

To provide redundant monitoring and control of control relay, the main transformer at the new Balranald Substation is being constructed for Transgrid. The RTU must poll twelve Alstom MICOM 'P' series control relays both current status and stored event data. It must also provide manual and automatic tapping control of the main transformer. Communication to a local PC Citect SCADA system and a remote LOGICA network remote monitoring system.

### ***Kingfisher RTU Hardware Solution***

The specification called for dual redundant RTU processors on separate backplanes, I/O on a separate backplane and dual redundant communications interfaces with the protection relays.

Our Kingfisher RTU solution used 2 x 6 slot backplanes, each with their own PS-20 power supply module, CP-21 processor and 2 x MC-10 communications modules, and a 12 slot backplane loaded with a power supply module and I/O modules. This setup allowed either processor module to communicate with any of the I/O or comms modules and ensured at least 2 data paths were available for comms with the protection relays, local SCADA host and remote SCADA host.

### ***Kingfisher RTU Software Solution***

The RTU uses three separate protocols to obtain data from the relays and allow it to be read by Citect and the LOGICA system.

### ***Alstom and GE Relays***

The Alstom and GE relays communicate with the RTU using the Modbus protocol. A variant of the standard Kingfisher driver was developed for this project to allow for the Alstom interpretation of the Modbus standard. The relays are connected to the RTU by three RS485 networks. Each connected at both ends to ports on MC-10 cards. This provides redundancy for the communications modules, and also partial protection against a break in a communications path. Changeover between the master and standby ports is done automatically by the RTU if no successful messages are detected on the master port for 60 seconds.

### **Citect SCADA**

The local Citect SCADA system is connected directly to both CPUs using the RS232 ports and the standard Kingfisher driver. Changeover between the two CPUs is done automatically by Citect. Citect reads status and event data from the RTU.

### **LOGICA System**

The LOGICA system is connected by an RS485 network to two MC-10 ports. Changeover between the master and standby ports is done automatically by the RTU if no successful messages are detected.

### **Remote System Support**

A PSTN port on the processor module allows remote access to the RTU system via PSTN for diagnostics and configuration updates.

