commtel™ case study

energy australia

providing critical backbone infrastructure for the transport of control data

Energy Australia operates one of the leading electricity networks in Australia, distributing electricity to Sydney and other regions, across 22,275 square kilometers. With hundreds of substations in the central business district of Sydney, CommTel's communications backbone transports the critical control data needed for the effective operation of the electricity grid in Australia's largest city.

Energy Australia is one of the largest energy suppliers in Australia, with over 100 years of experience. With an extensive electricity distribution network in the central business district of Sydney, spanning hundreds of underground and basement substations, a robust communications network was required – supporting both voice and data services.

Energy Australia will invest around $289 million in the five years to 2010 to maintain and improve the performance of the electricity network in the city of Sydney. Demand for power in Sydney's CBD is growing at almost 3% a year and is being driven by new residential, hotel and office developments. This growth is expected to continue, with a further 4900 apartments to be built and office space to grow by 8% by 2012.

The Constraints
The electricity grid of Australia's largest city is a vital piece of infrastructure, which places strict requirements on the supporting control systems. In developing a communications network to support the control system, a number of design constraints were in place:

- Full fibre-path redundancy to each node, with single-Fibre-working operation
- Maximum operating temperature of 65 degrees Celsius
- Support for 64kbps synchronous multidrop V.11, switched-Ethernet and telephony interfaces
- Small form-factor, suitable for installation in an Invensys C50 RTU subrack
- SNMP managed equipment

CommTel 's Approach
Through CommTel's partnership with Avara Technologies, all the network design constraints were achieved. The Avara Optical Access Point (OAP) formed the basis of the network, using a mechanical form-factor compliant with the Invensys C50 RTU.

At each substation, the OAP-SE was housed within the C50 RTU, taking power from the backplane. The 64kbps synchronous V.11 interface was physically patched to the RTU communications card, for transport of the control signals.

From each substation, two single fibres are routed via physically separate paths to a consolidation point. The OAP supports 1+1 fibre protection, thereby providing resiliency in case of a fibre break.

The OAP-SE converts its integrated FXS and Synchronous V.11 ports to layer 2 Ethernet packets and are placed on the fibre interfaces for transmission at 100Mb/s to the consolidation point.

At the consolidation point, the OAP-XE is used in a sub-rack. The sub-rack houses up to 15 OAP-XE's, with each of these capable of supporting two OAP-SE units with 1+1 optical redundancy. The subrack aggregates the multidrop V.11 circuits, such that thirty RTU's can be polled via a single V.11 interface. There is also the ability to subtend additional subracks, such that more RTUs can be polled through a single V.11 interface.

Quick Facts
- One of Australia's Largest Energy Suppliers
- Demand for power growing at 3% per year
- Full Fibre-path redundancy to all nodes
- Avara OAP-SE in all Invensys' C50RTU Units
- Support for POTS Equipment
- 108 Emergency phones

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Due to the harsh substation environment, it was not possible to use VoIP telephones. The OAP's natively support two standard POTS handsets, suited to the rugged conditions. This was a mandatory occupational health and safety requirement, as the substations did not have cellular coverage.

At the OAP-XE, these telephone circuits can be configured to Interface directly to a PABX using the integrated FXO interfaces or converted to VoIP for termination on industry standard SIP Gateways.

By taking an innovative approach with Avara Technologies, all the project constraints we met within an integrated unit. In addition to supporting the synchronous V.11 serial interface, the sub-stations are now equipped with fast Ethernet bandwidth to support future services.

About Commtel

CommTel is a leading international provider of advanced and engineered solutions for mission and business critical networks. We are a technology integrator, specialising in the delivery of network solutions that ensure the reliable delivery of vital services such as water, gas, electricity, public transport, and emergency services.

CommTel is widely known for innovative technology solutions, providing the network infrastructure and associated applications that optimise existing networks, as well as delivering digital transformation programs that provide a seamless transition from legacy to new technology.

Businesses in the mining, transport, oil & gas, utilities and emergency services sectors rely on CommTel as their trusted, long-term partner to ensure their systems meet their exacting requirements in the critical areas of safety, reliability, capacity, efficiency, intelligence and security. CommTel is certified to the highest international standards for Security, Health & Safety and Quality, and maintains a strong commitment to the environment.

To find out more about how CommTel can take your business into the future, visit www.commtelns.com

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