Motor control centres for coal terminal

Noja Power has been awarded a contract from the Ports Corporation of Queensland to design, manufacture, test and deliver low-voltage motor control centres (MCC) for the Abbot Point Bulk Coal Terminal upgrade.

This project, of which Connell Hatch is the engineer, is designed to increase the capacity of the coal handling facilities to 25Mt/a.

Monitoring and control of the motor drives is through Devicenet and Controlnet protocols over an RS-485 communications bus supported by Allen Bradley DYN42R starter auxiliary units.

Variable speed motor control is achieved using Allen Bradley Powerflex drives installed together with line reactors in fan cooled enclosures mounted separately from the main MCC.

Earth leakage protection is provided by the new Terasaki ZS range of moulded case circuit breakers. These devices provide standard thermal-magnetic overload functionality but has the advantage of not requiring a separate earth leakage toroid.

The motor control centres are manufactured to operate in harsh environments.

Noja is manufacturing intelligent MCCs incorporating direct online motor drives and variable speed drives, connected to a plant-wide control and monitoring system.

The MCCs are designed to AS/NZS 3439.1 and must pass a factory acceptance testing and pre-commissioning process carried out by Noja Power and Connell Hatch.

This design satisfies the nature of the work which involves installation in existing buildings and presents equipment installers with significant space constraints.

In these conditions, the MCC provides the designer with flexible options including full-depth cable ways utilised to accommodate the control and monitoring hardware without requiring additional tier space.

The safety interface to the control system uses Silbus equipment, Pilz relays and Dupline carriers for conveyor safety and control.

Each motor drive cell door is fitted with voltage vision device to provide unambiguous indication of an energised motor drive.

The circuit brakers are fitted with AGR-31 over-current relays to provide the specified under voltage protection on an individual phase basis. These relays also provide power management functions accessible locally from the large LCD or remotely using the Modbus communications interface.

To cope with the harsh environment of a coal handling facility, the MCCs are manufactured with a high ingress protection index, all busbars are fabricated using tinned copper and each tier is fitted with oxidation and corrosion inhibitors.

Composite poles installed in Canberra

ActewAGL is installing composite poles into Canberra backyards from Armor Utility Structures for use in the power grid.

A legacy of Canberra's original planning, ActewAGL has about 28,000 low voltage poles in residential and commercial backyards within the ACT.

As the poles are in backyards, the restricted access does not allow the installation of a standard wooden, concrete or steel single piece pole.

The only multipiece poles available for installation with a lifting beam are composite and steel. The advantages of composite poles compared with steel poles are lighter weight, non conductive, non corrosive and less expensive.

The poles used in the replacement were a non conductive, lightweight pole which can be installed with light machin-

ery and a lifting beam with a lower overall cost than wooden poles.

Mini excavators and elevated work platforms, scaffolding and ladders are used to maintain and/or replace backyard low voltage poles. Three piece steel poles are used as each section is small enough to be man handled into position and installed onsite by a manual carbon fibre lifting beam. The pole hole and pole base is installed by a mini excavator.

The fibre reinforced composite poles were sourced from Canada by the local licencee AUS, who are planning to manufacture the poles locally in the near future.

There are now 86 fibreglass low voltage poles in service in the ACT and another 72 will be installed. The project is expected to be completed in July.

The poles have a polyurethane-based resin which provides structural advantages over traditional polyester or vinyl-ester based resins without diminishing the dielectric strength, resistance to rot and elimination of corrosion concerns and damage from insects and birds that the earlier composites were noted for.

One of the 28,000 composite poles to be installed as part of the upgrade.

They poles come predrilled for standard applications and utilise concrete pole fittings for special applications. Unused holes are plugged to prevent access by bees, wasps and birds.

According to ActewAGL's overhead asset manager Wayne Cleland, the major challenges were arriving at the correct design configuration to meet ActewAGL requirements and suit the manufacturers standard range of products on offer.

Modifications had to be made to the lifting device to allow for steel and fiberglass pole lifts as the poles have different centres of gravity.

Staff were then trained training in the installation

The fibreglass poles are made from two pieces. The first section is installed by the excavating machine prior to an outage. The new fiberglass pole is installed as close to the existing pole as possible. The second stage is installed using a carbon fibre lifting beam specifically designed for installing multi piece poles in restricted locations.

The lifting beams attaches the first stage of the fibreglass pole with the second stage hauled into position manually using a pulley system attached to the lifting beam.

The lifting beam has been made from carbon fibre and aluminum to reduce the weight as the lifting beam is installed manually by the line staff during the pole replacement outage. The old wooden pole is cut down in stages to enable its removal from site.

Fibreglass poles are consistent with ENA Specification 009 for pole supply and performance has been trialled.

Further development is proposed for the use of fibreglass poles on ActewAGL's high voltage network.