

## MISSION STATEMENT:

We offer our customers integrated solutions using innovative products, combined with unrivaled service and reliability worldwide.

## NOJA Power Reclosers to Increase Distribution Network Reliability in Brazil

Companhia Energética de Minas Gerais (CEMIG) has awarded NOJA Power a contract to supply the state of Minas Gerais, Brazil, with 179 OSM27 Reclosers. NOJA Power will supply the recloser units – complete with RC01ES control and communications cubicles – as the result of an international tender with an exhaustive technical and commercial evaluation process.

CEMIG's reputation on the international market is considerable. Not only are they the only Latin American electricity supplier to be listed on the Dow Jones Sustainability Index, but this year is the ninth consecutive year that CEMIG has been listed. CEMIG achieves this through its commitment to its customers and its ability to provide sustainable employment for over 10,000 employees.

CEMIG is one of Brazil's most important energy suppliers, both in terms of size, connections served, and technical expertise. CEMIG's distribution network covers 96.7% of the state of Minas Gerais, an area roughly the size of France, with a total network length of over 350,000 kilometres and 55 power plants. In their continuing effort to supply over 17 million people, CEMIG employs one of the most broad and ambitious modernisation programs in Latin America.

CEMIG's primary energy matrix is hydroelectric power, making efficient use of the Minas Gerais region's abundance of fast-running rivers. CEMIG's commitment to sustainable energy also sees them make significant investment in developing practical applications for solar, solar thermal, and wind alternative energy sources. Many of CEMIG's renewable energy initiatives are actively supplying significant energy into the distribution network.

NOJA Power's contract with CEMIG comes as part of CEMIG's ongoing Master Technology Plan, an annual initiative to modernise the state's power network and to invest in new technology, with a focus on improving the safety and reliability of their

network. NOJA Power's reclosers will be used to increase the reliability of the medium-voltage overhead network especially in remote and rural areas. The OSM units will allow for automation and remote control over various communications mediums, including radio modem, GSM modem, and fibre optics. These remote mediums will allow CEMIG to manage and maintain power directly from the CEMIG master SCADA, via the DNP3 communications protocols.



CEMIG Headquarters, Brazil

Prior to awarding NOJA Power the contract, CEMIG sent an inspector to the NOJA Power factory in Brisbane, Australia, to perform a comprehensive audit of the company's manufacturing and quality processes.

The success of the contract will be supported by FEST, NOJA Power's exclusive representative in Brazil. Bruno Kimura, the Brazilian engineer who completed an internship with NOJA Power in 2006, will provide exceptional first-hand local system integration and technical support.

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# Powerco Successfully Commissions Automatic Backfeed Restoration Scheme

Powerco, New Zealand, has commissioned its Pohangina Apiti automatic backfeed restoration scheme, utilising the NOJA Power OSM15 recloser units already deployed throughout their network. Powerco previously relied on a SCADA system for manually determining the direction of a fault, but moving to an automated back feed restoration system will significantly reduce SAIDI minutes in the Powerco network.

Powerco is the second largest energy distributor in New Zealand, supplying over 312,000 connections in the North Island urban centres of Palmerston North, New Plymouth, Wanganui, and Masterton, as well as the surrounding rural areas.

Automated backfeed restoration is the process whereby two feeders are tied by a 'normally open' recloser. This recloser monitors voltage using voltage sensors on either side to detect if power is lost on one of the feeders, and if voltage is lost for a certain interval, the tie unit will close, restoring power by backfeeding from the non-faulted feeder.

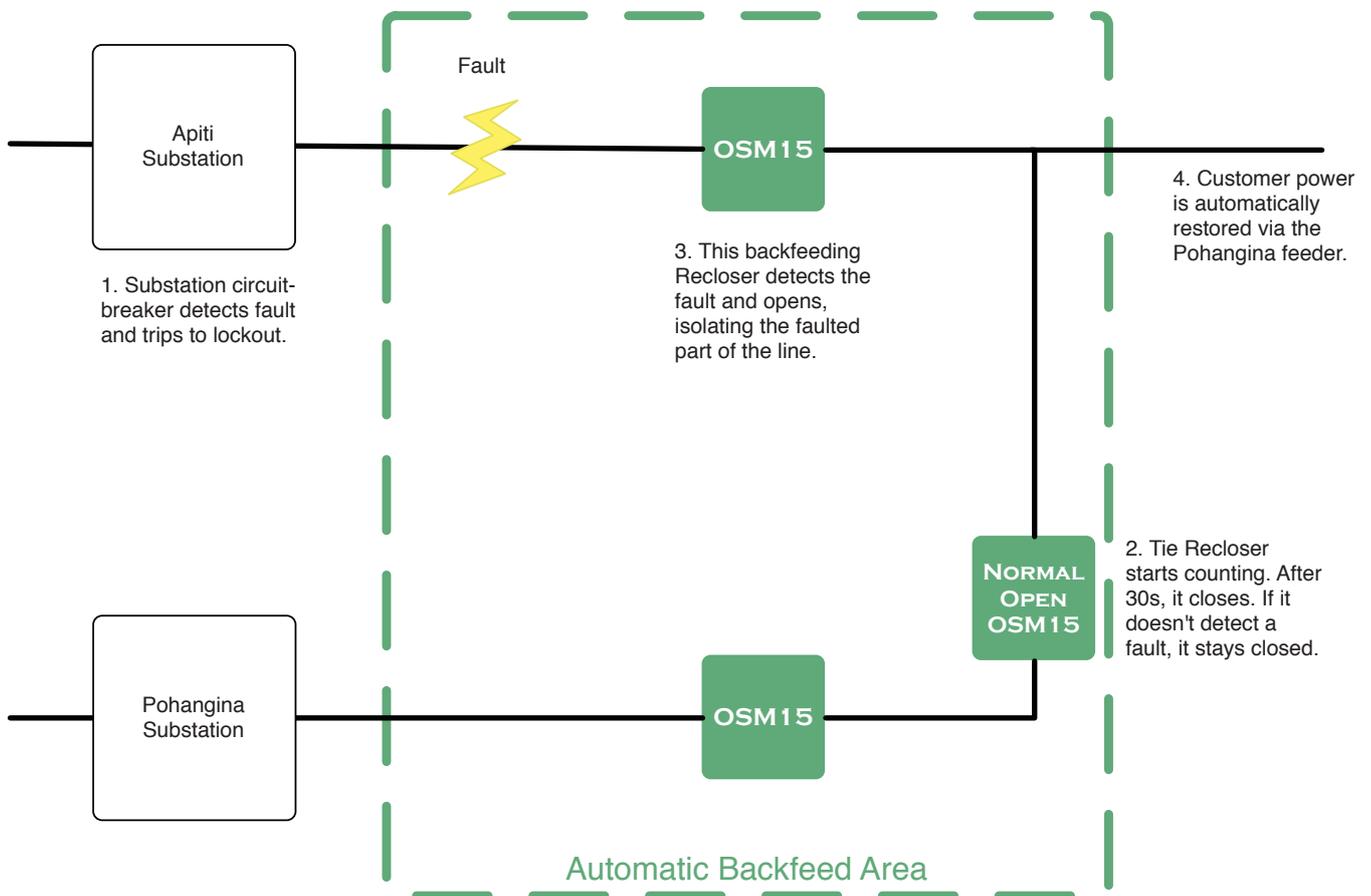
In order to safely take advantage of automated backfeed restoration, a power utility must conduct a study to determine the correct amount of torque angle to apply during a fault condition, in order to correctly detect the direction of the fault, and thereby apply the correct protection settings. Powerco took advantage of the OSM's capabilities to calculate polarising voltage, operating angle, and current to accurately determine fault direction.

"Essentially, the OSM reclosers used in this scheme are the same device that has been used elsewhere in the Powerco network. However, additional logic has been enabled that can detect a directional fault or sense a loss of voltage about each of the device's high voltage terminals," states the Powerco report on the study.

The OSM15 were ideal for this scheme since they already include the directional and automatic backfeed restoration features in the standard unit, and NOJA Power was able to provide detailed service and support for implementing these features.

The Pohangina and Apiti feeders were selected because their conductors had adequate capacity to support backfeed restoration, and because the very long (180 km) Pohangina feeder would stress test the limiting factor of voltage support. The study concluded that backfeed current would be satisfactory even during periods of very high load, allowing a safe forward current of 120A and a backfeed current of 90A along either feeder.

Since Powerco already uses OSM15 reclosers on their network, the success of this study could open the way to automated back feed, where network configuration, capacities, and devices allow.



An example of a typical Automatic Backfeed Restoration operation on the Apiti Pohangina feeders

# NOJA Power Continues to Supply MCCs for Abbot Point Coal Export Upgrade

NOJA Power has been awarded a contract from MiE to design, manufacture, test, and deliver Low Voltage Motor Control Centres for the X50 phase of the Abbot Point Bulk Coal Terminal Upgrade. This contract follows the successful completion of NOJA Power Switchgear's contract to supply the X25 phase of this ambitious project. The X50 upgrade program will increase the capacity of the Abbot Point coal handling facilities to 50 Mt per annum, effectively doubling the capacity achieved in the X25 upgrade.

MiE is a leading Australian instrumentation and electrical supplier that and is a subsidiary of the Monadelphous Group. MiE is committed to providing innovative and high-quality electrical engineering solutions throughout Australia and the Asia-Pacific Regions, and is awarded the PCQ contract for the HV infrastructure upgrade turnkey works.

NOJA Power is manufacturing Intelligent MCCs, incorporating DOL motor drives and Variable Speed motor drives, interfaced to a plant-wide control and monitoring system. The upgrade is part of the ongoing project at Abbot Point for PCQ, a government-owned corporation, with engineering to the project provided by Connell Hatch.



The site for the Abbot Point X50 Expansion facilities

The MCCs ordered are designed to AS/NZS 3439.1 and pass a comprehensive Factory Acceptance Testing and pre-commissioning process carried out as a joint effort by NOJA Power, Connell Hatch, and MiE. Monitoring and control of the motor drives is by way of Devicenet and Controlnet protocols over a communications bus. Motor drive information is provided by Sprecher and Schuh CEP7 C3 Intelligent Motor Overload units. Variable speed motor control is achieved using Allen Bradley Powerflex drives installed together with Line Reactors, housed in fan cooled enclosures mounted separately from the main MCC.

The NOJA Power MCC is an ideal choice as it 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 utilises Silbus equipment, PILZ relays, and Dupline carrier for conveyer safety and control. Each motor drive cell door is fitted with a Voltage Vision device to provide unambiguous indication of an energised motor drive. Earth leakage protection is provided by the new Terasaki ZS range of Tembreak 2 Moulded Case Circuit Breakers. The ZS range MCCB provides standard thermal-magnetic overload functionality but has the advantage of not requiring a separate EL toroid. Terasaki's Tempower2 ACBs are fitted with AGR-31 over current relays to provide the specified under voltage protection on an individual phase basis.

The AGR-31 OCR also provide full power management functions accessible locally from the large LCD or remotely via the MODBUS communications interface, making a separate PM relay and CTs redundant, minimising the space requirements. To cope with the harsh environment of the portside, 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.



MCCs currently on site at Abbot Point



# Clem Jones Tunnel Powered by NOJA Power Cross Passage Panels and Road Side Cabinets

NOJA Power is pleased to be supplying United Group with a batch of roadside cabinets and cross-passage panels as part of the Clem Jones tunnel (formerly North South Bypass tunnel) project in our home city of Brisbane, Queensland.

United Group is a leading Australian diversified services company, with over 30 years experience in providing construction, engineering, and maintenance services for companies and governments worldwide.

NOJA Power will assemble and deliver 45 cross-passage panels for placement through the tunnel, and 46 roadside cabinets for placement near incoming and outgoing traffic.

The cross-passage panels will be situated in cross-passages between the northbound and southbound sections of the tunnel, and will be responsible for power distribution, active monitoring and control of essential systems (ventilation, lighting, alarms), for relaying and controlling variable traffic signs, and for controlling the tunnel's CCTV system. Each panel will be equipped with a PLC unit for intelligent relay control. Due to the enclosed nature of the environment, the PVC wiring and bracketing in the units have been replaced with LSZH thermoplastics.



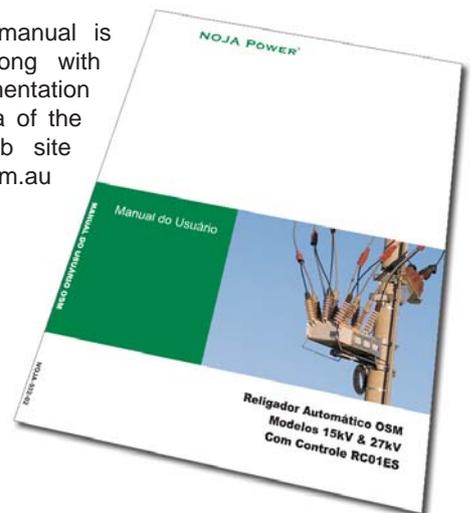
Cross-Tunnel Panels being assembled for the Clem Jones Tunnel

The roadside cabinets are to-specification roadside cabinets with an active ventilation system designed to keep the cabinet internals within 1-2°C of the ambient temperature. They will be responsible for monitoring the traffic conditions outside the tunnels, and relaying this information to the tunnel SCADA system as well as the cross-passage PLCs for automated control of the variable traffic signs.

## Portuguese Version of OSM User Manuals

NOJA Power has released a Portuguese version of the OSM Automatic Circuit Recloser technical manual, to support our clients in Brazil. This manual will accompany OSM15 and OSM27 units delivered in the future, representing NOJA Power's continued commitment to our international clients.

The Portuguese manual is also available along with all of our documentation in the secure area of the NOJA Power web site [www.nojapower.com.au](http://www.nojapower.com.au)



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