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## An Iconic Reconfiguration (Benmore Power Station)

**PBA have recently been successful in securing a significant project with Meridian Energy, the Benmore Final Configuration Project.**

PBA were awarded the site works for the project known as the "Benmore Final Configuration Project" (FCP) which will be carried out in three main stages over a two year period commencing September 2010.

Under this project each of the six 16kV generators are reconnected to the 220kV national grid via six new Generator Circuit Breakers (GCBs) and three 220/16/16 kV three winding Transformers.

This project involves the installation and commissioning of two additional new three winding transformers. Each of the three 220/16/16 kV three winding Transformers will interconnect two generators to the 220kV national grid with one generator on each of the two 16kV secondary windings. The connections between the transformer and generators are made via isolated phase bus (IPB).

The project encompasses many aspects and disciplines typically associated with large projects in the electricity industry including civil construction, electrical installation including IPB and overhead lines, transformer assembly, HV testing, control and protection testing and commissioning.

By its very nature, work in the electricity industry is required to be undertaken to a very high standard of safety, quality and workmanship. PBA have the experience and systems to meet these challenges.

Working with our New Zealand subcontractors, PBA brings together a 100% Kiwi group of companies to deliver the FCP at one of New Zealand's most iconic power stations with traditional kiwi know-how and a first class team.

**Wellington Office**

53A Kenepuru Drive  
Porirua, Wellington  
PO Box 54191  
Mana, Wellington 5247  
Phone: 04 237 7297  
Fax: 04 237 7163

**Christchurch Office**

Unit C, 33 Foremans Road  
Hornby, Christchurch  
Phone: 03 344 2972  
Fax: 03 344 2973



# PBA gains Transpower Pre-Qualification

**PBA is pleased to announce that Transpower New Zealand have approved pre-qualification to PBA to provide services in their projects area. Transpower owns and operates New Zealand's high-voltage electricity transmission grid.**

To work on Transpower assets, a company needs to be pre-qualified and meet the required standards. PBA has been working closely with Transpower over the past few months to assess PBA's capability and systems to ensure they meet the required standards. The systems that need to be demonstrated include safety and health management, risk management, quality management and environmental management.

PBA has a team of technical specialists with many years experience and expertise in the New Zealand high voltage electricity industry. This includes the specialist areas of HVDC, circuit breakers, transformers and SF6. When you combine this expertise and knowledge with the most up-to-date service, test and commissioning equipment available, PBA has a team that can deliver projects of a technical and complex nature safely and to a high standard.

Obtaining Transpower pre-qualification is a major milestone for PBA, and we look forward to the opportunity to provide project services to Transpower in the future.

## PBA assists with Cleardale Hydro Project

**PBA was contracted to carry out the physical installation of the electrical equipment for a hydro power station being built by MainPower situated 20 km north-west of Methven in Central Canterbury.**

Cleardale power station is a small hydro generation project of 900 kW and feeds directly onto the Electricity Ashburton Network. Cleardale posed many challenges for the construction team due to weather and terrain difficulties but all were overcome to see the station commissioned just prior to Christmas 2010.

The turbine is spun using water collected some 2.5kms away which goes through a series of settling basins to remove the grit found in Canterbury rivers before entering the penstock and dropping in altitude around 300 metres.

The generator and turbine were installed by another contractor with all secondary systems being installed and tested by PBA. An aluminium busbar was installed to carry the high current 400V from the generator to the Step Up Transformer on the outside of the building. The Transformer was cabled to the 11kV Circuit Breaker and then onto the local network via a set of CT's, VT's and an isolator, all of which were installed and tested by PBA.



# Circuit Breaker Diagnostics

**Circuit Breakers occupy an important place in any electrical system, disconnecting faulty equipment from the system to prevent further damage to the faulty plant, and damage to other equipment seeing the fault current.**

When Circuit Breakers fail, it can prevent a faulty piece of equipment being disconnected from the supply of energy, causing the fault to develop and increase in severity, causing more damage to the initially faulted equipment and perhaps causing other equipment to fail as well. Circuit Breaker diagnostic testing can be used to identify problems with circuit breakers before they progress to causing the circuit breaker to fail.

Circuit Breakers are a prime example of an electromechanical system – they are typically operated electrically via small relays which in turn operate a series of mechanical latches which release stored energy contained in a spring, or compressed mediums.



Circuit Breaker Motion Testing is an important diagnostic tool for determining the condition of high voltage circuit breakers. Motion Testing involves connecting a transducer to the operating shaft on the mechanism box or poles and measuring its motion as the circuit breaker operates. Leads are also connected across the interrupter to measure the timing of the main contacts. By carrying out motion testing, and recording the motion curve, the movement of the breaker through its entire operation can be checked. This coupled with a detailed inspection of all parts accessible in the mechanism box can give reassurance that the circuit breaker is in a healthy state.

PBA have a wealth of experience in circuit breaker diagnostics, specifically in motion testing and use an Elcon SA-10 Motion Analyser to test circuit breakers. Our circuit breaker experts respond promptly to requests for service, whether they be planned or emergency. The PBA team have the following circuit breaker capabilities:

- Several factory trained experts.
- ISO 14001 and 9001 business system certifications.
- A full suite of Circuit Breaker and SF6 test equipment compliant with national industry standards.
- Experience with the complete range of circuit breaker technologies throughout New Zealand.

# The Growing PBA Team



A recent PBA function was a great way for PBA families to get together and reflect on what has been a very successful year. With new projects and more opportunities to provide our services and expertise, to new and existing clients, 2011 will be an exciting year for PBA.

## An Emphasis on Quality



Phil Hickin has been involved with the New Zealand electricity industry since 1966 where in the Palmerston North district he started as a Hydro apprentice. He then trained and worked as a communications technician at the Whakamaru North Island control centre and a technical officer for the communications and remote control equipment for the Upper Waitaki power project. During the Rangipo power project, Phil worked on the communications and remote control aspects of the project. At the completion of this project he held several management positions including Resource Manager at Tokaanu.

During this time he developed and implemented quality systems for the area Hydro power stations to ISO9001 and 14001. Tokaanu was the first Hydro scheme to obtain ISO14001 in the southern hemisphere. Phil also gained qualifications in adult education, quality management and business management.

**In 2000 Phil started his own consultancy business and offered his clients the following services;**

- Developing quality and environmental management systems to ISO international standards
- Auditing of work control, quality and environmental management systems
- Coordination and mentoring of trainees within the electricity industry
- Assessing of trainees to NZQA unit standards

For over 10 years, Phil has built a highly successful business based on quality and his clients include power generation, electricity distribution and electrical contracting companies. In 2009 Phil added PBA to his client list. Phil has worked closely with PBA over the last two years to develop and implement the quality systems in PBA that are certified to ISO9001 and ISO14001 international standards. He is also working with PBA as an independent auditor to monitor compliance and assist with continuous improvement. PBA thanks Phil for his assistance in ensuring that PBA has world class quality systems.

