

# Ross Island PowerStore Project, Antarctica, 2009



New Zealand's Scott Base and America's McMurdo Station in Antarctica are home to about 1200 people in the summer. These important research bases have always relied on fossil fuels for power, but the installation of wind turbines and Powercorp's PowerStore and control technology has changed all that. While the bases will still need back-up generators, the consumption of diesel is set to drop significantly.

The project is part of the New Zealand Government's initiative to contribute to the joint support of the Antarctic New Zealand and United States Antarctic Programmes. Meridian Energy contracted Powercorp to help develop the complex system, having seen the success of Powercorp's Mawson base project, the only other Antarctic wind farm in existence.

Meridian director of growth and development, Ken Smales, said this project was complex, not because of Antarctica's extreme weather, but because the turbine had to be integrated with the diesel generation plants of the two bases, which operate at different frequencies 50Hz (NZ) and 60Hz (US). The Powercorp Frequency Converter overcame the problem of the two bases operating at different frequencies.

The system will save 463,000 litres of diesel every year, which equates to 1,242 tonnes of CO2 emissions every year between the two stations.

Powercorp is proud to have been selected by Meridian Energy to be a crucial partner in the delivery of yet another world leading power system in the extreme and pristine environment of the Antarctic.

## Project Information

<b>title:</b>	Ross Island Wind Energy Project - Stage 1
<b>region:</b>	Ross Island, Antarctica
<b>customer:</b>	The New Zealand Antarctic Institute and Meridian Energy Ltd
<b>commissioned:</b>	2009
<b>power system type:</b>	Wind/Diesel/Flywheel
<b># generators:</b>	Wind Turbines x 3 Diesel Generators x 6
<b>wind turbines:</b>	Enercon E33 Wind Energy Converters

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**powercorp**

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**Powercorp Pty. Ltd** was established in 1988 to develop innovative solutions for remote diesel power stations in the north of Australia. Over the years Powercorp engineers have developed sophisticated management systems for all levels of power station operation and have implemented these applications throughout the world.

In addition, Powercorp has developed a number of leading edge products for the Renewable Energy industry, most notably its flagship PowerStore system and its own Distributed Control System.

The PowerStore is a flywheel/inverter device designed to provide grid stabilising of both voltage and frequency by either sinking or sourcing real and reactive power. This action is uniquely Powercorp's IP because of the speed and rating of the power flow. The PowerStore is able to sink and source MW of power in less than 5msec thus acting fast enough to dampen most electrical network disturbances. The Distributed Control System utilises Powercorp's well proven power station control system software in a new format designed for maximum flexibility, redundancy and modular application.

The head office in Darwin includes suitably equipped workshop, testing and training facilities. Of particular note is the power station simulator which provides a 1:50 scale test and development platform operating in real time and with actual operational data as its source configuration. This complex and unique platform proves out digital control algorithms both for development and fault finding. Dynamic testing is achieved using an additional platform incorporating real generators and switchgear. Because the software for its products has been developed "in house", Powercorp has the ability to customise it to suit the individual customer needs.

Additionally, Powercorp has the expertise and know-how to develop new control modules or features. Powercorp is able to undertake power flow, and dynamic stability computer modelling. This combined with the engineering competence of the company provides a strong consulting capability.

Both engineering design and consulting are offered to the client base, combined with a vision to the future, this amounts to a highly specialised boutique company that can offer innovative solutions tailored to the individual customer needs.

