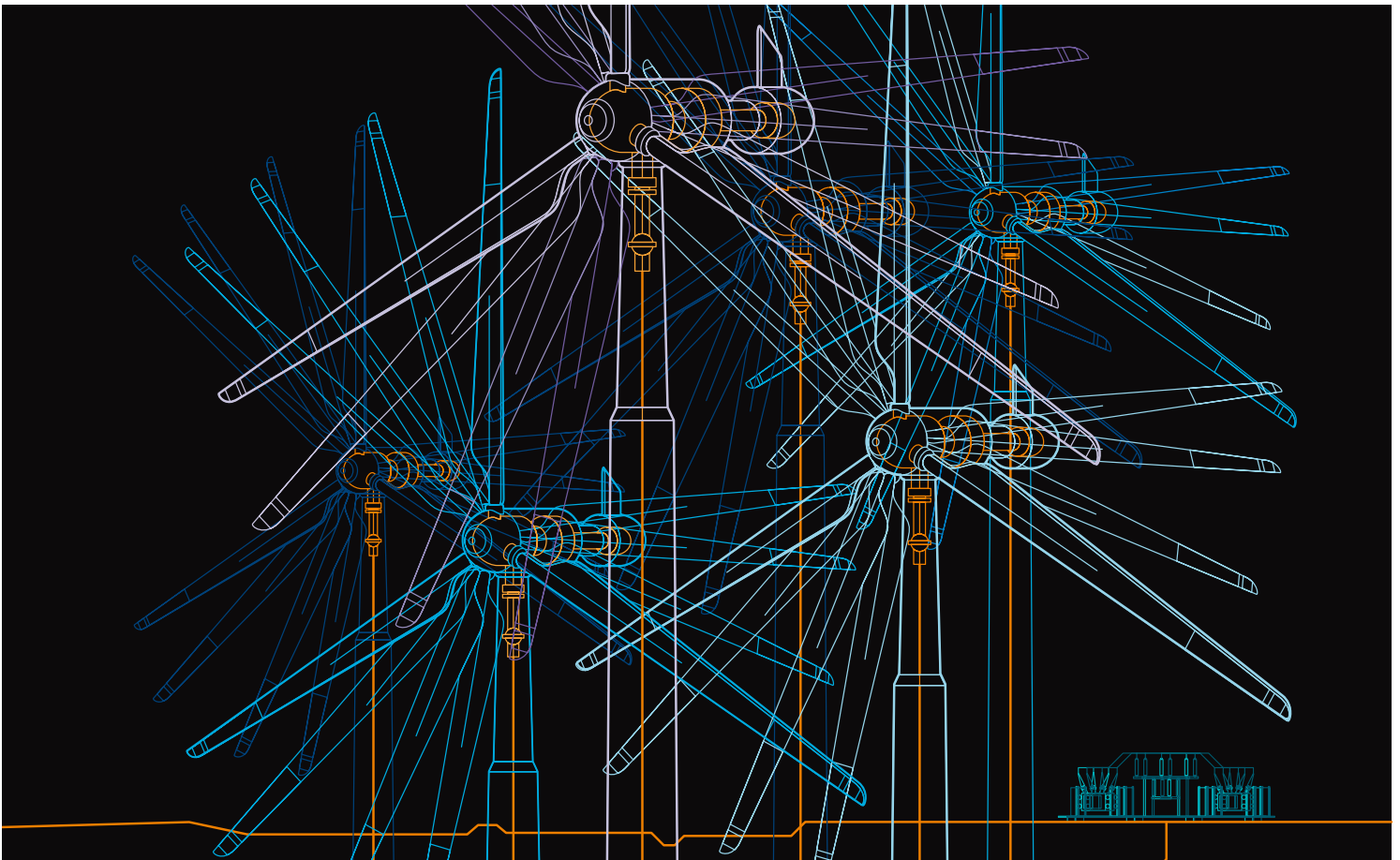


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The customer magazine
of the ABB Group
New Zealand

source



Ensuring reliability

Feature story 06

Providing power stability to the world's southernmost wind farm

ABB's AVC technology 09

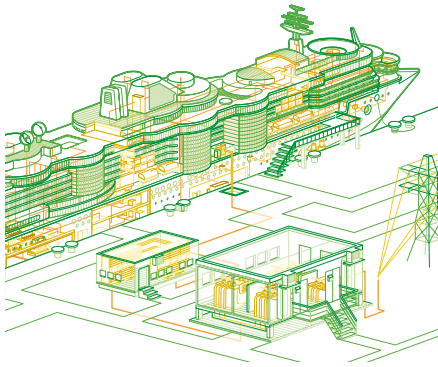
Protecting NIWA from the elements

Powering the line 12

ABB helps keep our capital city moving

Power and productivity
for a better world™





04

Shore-to-ship power

NZ technology enabling shore-to-ship power in Sweden



06

Ensuring reliability

ABB helps stabilise power to the world's southernmost wind farm

source

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Grant Gillard
Managing Director
ABB New Zealand

Welcome to ABB's first magazine for our New Zealand customers.

We plan to send you this magazine twice yearly. It highlights our recent project work, new products and services, and other power and automation technology news.

2010 has been an interesting year for ABB New Zealand so far. The delivery of clean and efficient energy is a very important focus for ABB, so we were proud to be involved in Meridian Energy's wind farm on Ross Island, and we have chosen this as our feature story in this edition.

Some of the same underlying technology was employed in Sweden, where we are working to reduce the pollution in Gothenburg harbour by providing electricity conversion systems so that the shore power supply can be used onboard the

ships while they in port – allowing the diesel generators to be turned off.

Helping Wellington get moving was also an exciting project to be involved with for KiwiRail. This was the first project of its kind we have undertaken in New Zealand and we hope to get the opportunity to be involved with any future rail initiatives nationwide.

Keep an eye out for our next edition of Source in the new year, where we will be featuring our hydro upgrade works for Genesis Energy which is due for completion at the end of this year.

As the year draws to a close let me wish you a happy and safe summer, and a prosperous beginning to 2011.

Don't forget to send us feedback or contact us if you have any questions.



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Protecting NIWA from the elements

ABB's AVC technology protects NIWA's new super computer



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Powering the line

ABB provides power infrastructure for KiwiRail's electric rail upgrade in Wellington

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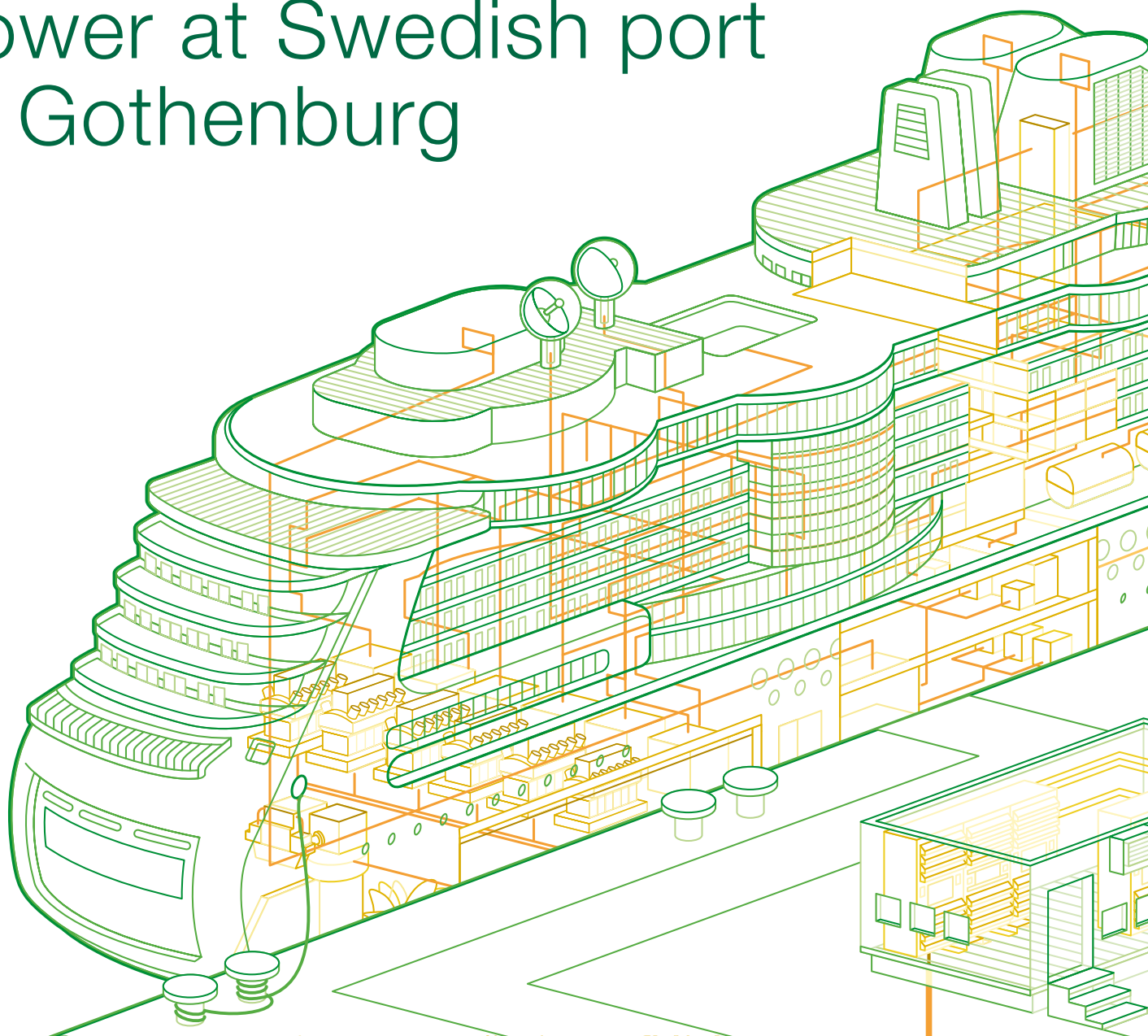
Stories in short

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ABB to enable shore-to-ship power at Swedish port of Gothenburg



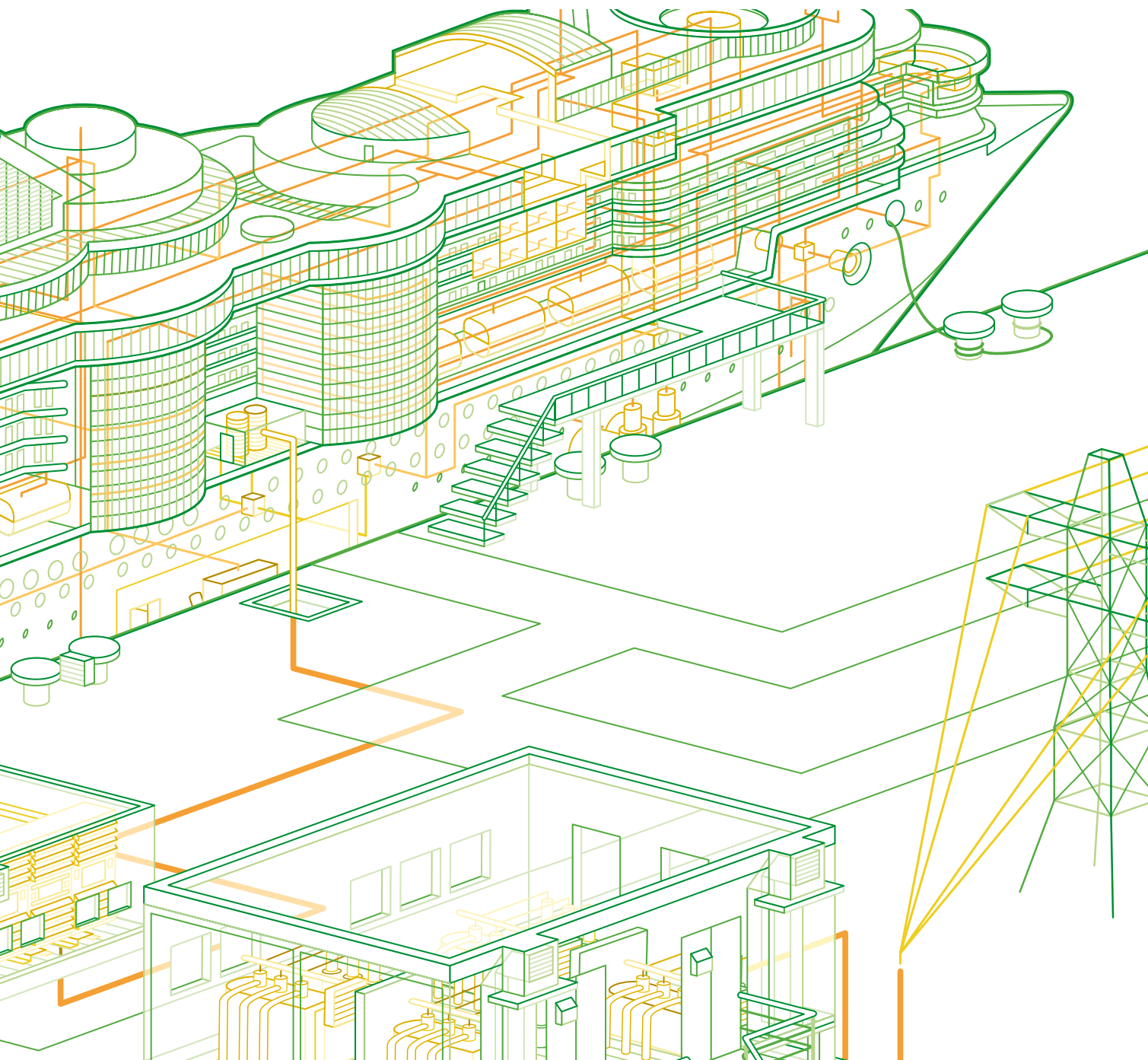
On-shore substations to supply power to docked ships and reduce local emissions

ABB's Power Electronics team, based in Napier, New Zealand are supplying static frequency conversion technology as part of a large substation order to supply shore-to-ship power at the Swedish port of Gothenburg.

As part of the project, ABB will collaborate with Processkontroll Elektriska to provide the necessary infrastructure to supply electrical power to a large number of Stena Line vessels using the port. The new installation will be jointly owned

by Stena Line and the port of Gothenburg. ABB will be responsible for the design, engineering, supply, and commissioning of the shore-side substation, which will supply vessels with 3 MVA, 11 kV power. It will be the biggest installation of its kind; capable of providing power at both 50 Hz and 60 Hz. Equipment to be supplied includes power transformers, frequency converters, medium voltage switchgear and monitoring and safety equipment. The project is scheduled for completion in 2010.

ABB New Zealand's manufacturing and technology facility in Napier is supplying two PCS100 1250 kVA static frequency converters (SFC) to convert the 50 Hz



shore power to 60 Hz as required by the vessels. The ability of multiple PCS100 SFCs to operate in parallel, with automatic load sharing, is used to full effect in this project. Other features such as power module redundancy typical to all PSC 100 SFC systems, make for an extremely reliable 60 Hz vessel power supply.

“Over the past two years ABB’s Low Voltage Power Converter Products unit has received several orders for similar sized systems for shore to ship power supply projects, and we are pleased to be part of this world-wide initiative for a cleaner environment,” says Alan Cooper, LV Static Frequency Converter product manager.

ABB delivered the world’s first shore-to-ship power supply to the port of Gothenburg in 2000, and in 2004, the port received the “Clean Marine Award” for environmental responsibility from the European Union, for reducing in-port emissions of noise and airborne pollutants.

Background information

During a 10-hour stay in port, the diesel generators of a single cruise ship can burn 20 metric tons of fuel and produce 60 tons of carbon dioxide. This is equivalent to the total annual emissions of 25 average-sized European cars. These emissions can be mitigated by supplying the ship’s infrastructure with onshore power.

Port authorities and ship owners, spurred by emerging legislation in many parts of the world are seeking ways to reduce emissions as part of the global effort to mitigate climate impact.

In addition to reducing local carbon dioxide emissions, the use of shore-to-ship power in preference to onboard diesel generators helps to lessen sulphur dioxide, nitrogen oxide and particulate emissions. It also facilitates the reduction of low frequency noise and vibrations, and allows maintenance of diesel engines while the ship is at berth.



Up and running - the turbines on Crater Hill.

ABB technology helps stabilise power to the world's southernmost wind farm

Photography Meridian Energy

ABB's static frequency conversion technology, developed in Napier, was a key component for Meridian Energy's project building the world's southernmost wind farm, with Antarctica New Zealand.



The project, commissioned in January 2010, consists of three 330 kW turbines on Crater Hill which supply renewable energy to power New Zealand's Scott Base and its American base neighbour, McMurdo Station. The project links the electrical grids of both bases and reduces the carbon footprint of the Antarctic operations, as well as the environmental risks associated with transporting diesel fuel to Antarctica.

ABB's team based in Napier worked closely with PowerCorp, Meridian's principal contractor, to supply the technology, a static frequency converter (SFC), which provides the ability to shift power to and from the 60 Hz McMurdo Station to 50 Hz Scott Base grids.

ABB's Napier designed and manufactured PCS100 converter based energy storage systems (ESS) were also used by PowerCorp to interface energy storage flywheels to the grid, improving grid stability and the penetration of renewable wind power.

Limited conditions

The conditions in Antarctica meant that work was only able to be carried out during summer months when the site can be accessed due to warmer conditions (-37° C to +5° C). The first phase was completed over summer 08/09 linking the electrical grids of Scott Base and McMurdo Station before the wind turbines were commissioned during the subsequent summer of 09/10.



The 40 foot SFC being unloaded from a US C-17 Globemaster III aircraft and being transported to the base.



During the first phase, a US C-17 Globemaster III aircraft was utilised to transport the 40 foot SFC from New Zealand to Antarctica in order to meet tight commissioning timeframes.

Due to the remote location, Powercorp assembled a replica test system at their Darwin facility. ABB's team spent much of the second summer working with Powercorp's engineers on system customisation and testing in Napier and Darwin.

Perry Field, ABB's Project Engineer for the works, says that ABB's technology will provide high reliability, which is an absolute requirement in such a remote location: "The SFC is an essential component in the Antarctic power grid system. By connecting the McMurdo and Scott base grids the resultant larger power system allows more efficient use of renewable generation."

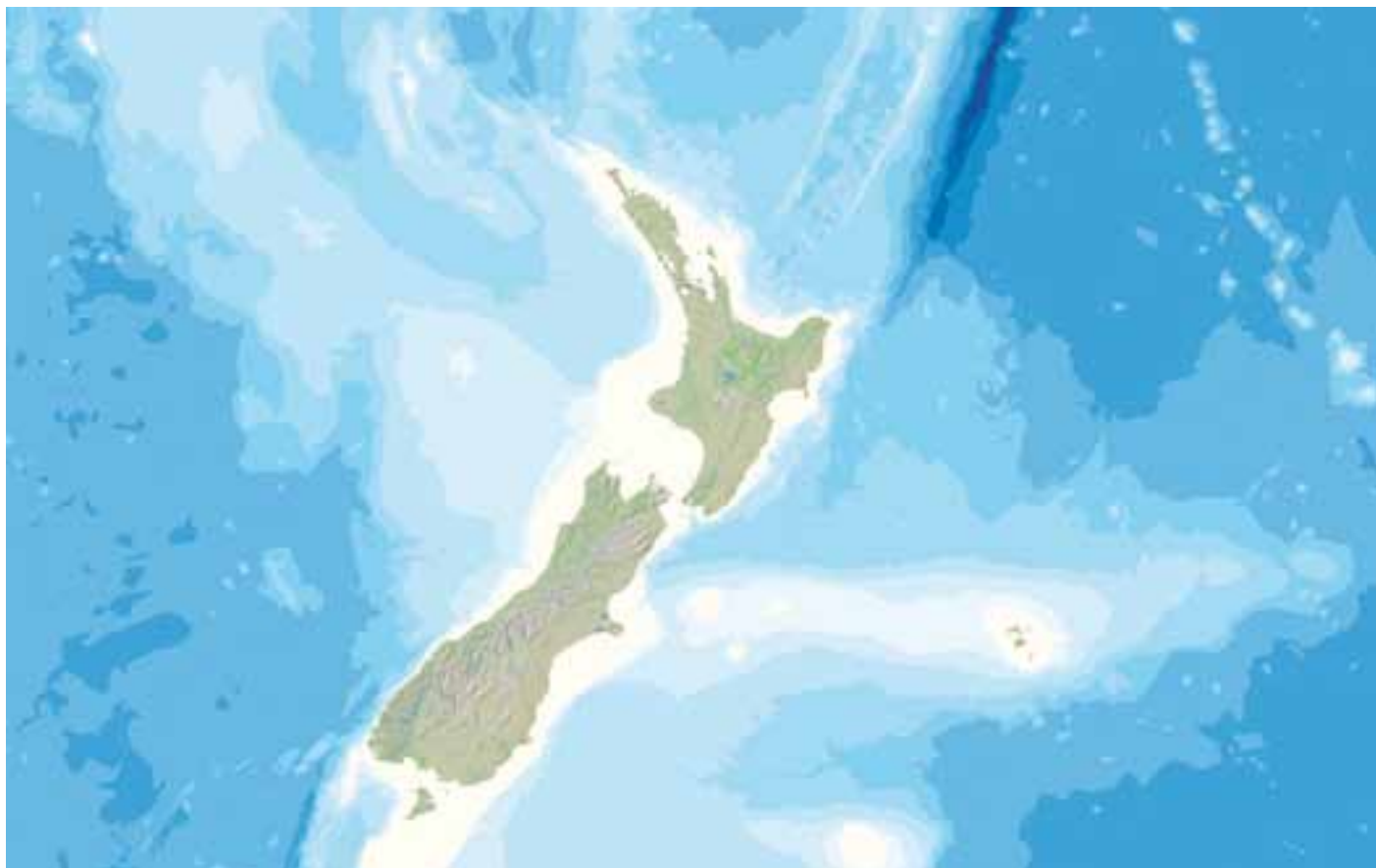
Facts about Meridian's project

Research commenced in early 2005 when Meridian and Antarctica New Zealand identified the prime area for the wind farm on Crater Hill. The site is one of the few ice-free areas on Ross Island and is also approximately halfway between McMurdo Station and Scott Base. Subsequent wind measurements proved it had a very good wind resource with an average annual wind speed of 7.9 m/s or 28.4 km/hr at 39 m (wind turbine hub height).

Everything has been specially designed for freezing cold temperatures and the project has taken several years. The turbines, which are 39 metres high with blades 33 metres across, can operate down to -40° C. Typically there is little wind when temperatures are below about -35 ° C.

The wind farm will provide the Ross Island System with up to 1000 kW of clean renewable energy, enough to power all of Scott Base and contribute to McMurdo's daily electrical demand.

The turbines are expected to allow a reduction in diesel fuel annually of about 463,000 litres (122,000 gallons) or about 11%. The wind energy also offsets 1242 tonnes of carbon dioxide (CO₂) annually, a key component of greenhouse gases.



Super computer has NIWA scientists buzzing

ABB's technology helps protect NIWA from the elements

A new super computer is set to improve NIWA's ability to forecast extreme weather events in New Zealand. The \$12.7 million IBM computer has about 100 times the power of NIWA's current computer and can supply much more information on future severe weather events such as flooding, and greater world issues like climate change.

The computer can perform 34 trillion calculations a second and is being hailed as the holy grail of forecasting by NIWA scientists. The new computer enables NIWA to make advances in the world of simulation and will provide more accurate immediate and long-term forecasts.

By examining the present, scientists can now project into the future and determine what the atmosphere, weather and climate will look like.

To provide this system with protection from the potentially destructive effects of voltage sags and power surges, the advice of telecommunications consultant, Telco Asset Management Services was sought, ABB's PCS100 Active Voltage Conditioner (AVC) 650 kVA solution was selected.

The PCS100 AVC is an inverter based system that protects sensitive industrial and commercial loads from voltage disturbances.

An ABB innovation, it provides fast, accurate voltage sag and surge correction as well as continuous voltage regulation and load voltage compensation. The PCS100 protects the NIWA high performance computing facilities' whole site power, as well as the equipment supporting the super computer environment.

Visit www.abb.co.nz/powerelectronics (power quality products) to see more on the PCS100 AVC

New premises and facelift for ABB in Mt Wellington



New premises and facelift for ABB in Mt Wellington

ABB has expanded its sales and support capabilities with a new premises, and refurbishment of an existing location in Mt Wellington.

New facility

ABB's sales and support functions for measurement products, motors & drives, PLCs, robotics, power electronics (Auckland sales team) and low voltage products have moved into brand new premises at 570 Mt Wellington Highway, Otahuhu (on the corner of Panama Road).

"To make room for extra stock and employees, we recently relocated the sales and marketing team to new premises not far from our Mt Wellington warehouse", said Melvin Penman, general manager for ABB's Low Voltage Products division and site manager for both the new offices and refurbished warehouse at Ponui Place.

Penman says the New Zealand Low Voltage Products division has grown rapidly in the last five years.

"We are increasing our stock to support electrical wholesalers and end-users more effectively. We now hold over \$5 million in low voltage stocks alone – so you can get what you need without delay.

"At the same time we have increased our technical support team. We now have three technical specialists you can call on for a timely response. They're here to help answer design queries and to advise on product selection," Penman says. "Our technical support team can help identify the product that is most suited to New Zealand conditions. We can also help with quick answers when you are migrating from legacy products to newer models."

The motors & drives sales and support team has also doubled over the last three years to meet increased demand within the market. ABB's drives product range is vast, with products covering small component drives through to large multiple mega watt industrial drives, each with references in New Zealand.

Motors & drives manager, John Keir, says, "We offer design, installation and commissioning support, no-obligation training courses, detailed documentation and preventative maintenance programmes. We also provide total solutions including relevant power quality and application considerations. With a heavy bias towards customer service and support, we are catering not just for end-users but for contractors, integrators and wholesalers as well."

The measurement products sales and support team has embarked on an ambitious growth programme both in terms of augmenting its employee strength and enhancing its stock holding in Auckland and Christchurch.

Mukesh Sharma, Manager for Measurement Products says, "Measurement Products is in the transition of relocating its customer services from Grafton Rd to the Mt Wellington Highway premises and we expect greater efficiencies in our customer services."

ABB Customer Training

One of the main features of the new location at 570 Mt Wellington Highway is a training facility purpose built for customer training sessions. Sessions will be run at the Mt Wellington facility by all ABB divisions, not just the ones located in the offices at Mt Wellington.

Training sessions are currently being planned with the intention of introducing them early in 2011.

Refurbished Warehouse

ABB's project to give its existing warehouse at Ponui Place a complete facelift is well underway.

Floors have been painted, a new racking system has been put into place and offices have been upgraded for the on-site service team.

As part of the overall upgrade at Ponui Place, ABB is also upgrading the Auckland Service Centre workshop, to better cater for the drives, industrial and marine work performed here.



The teams located at 570 Mt Wellington Highway will have their stock stored at Ponui Place, which is just around the corner from the sales office.

ABB delivers responsible energy management to film industry

ABB's Active Voltage Conditioning technology helps Park Road continue to "green the screen".

Park Road is part of New Zealand's creative community that includes the Academy Award winning Weta Digital, Weta Workshop and the sound stages of Stone Street Studios. This boutique post-production facility takes on selected projects each year, providing the resources and commitment required for film expression.

In 2007, at the Women In Film and Television (WIFT) Awards, Park Road was awarded the "Greening the Screen Award". An accomplishment acknowledging commitment to sustainability, responsible energy management and efforts in reducing the impact of the film industry on New Zealand's natural resource. With a continuing commitment to a smaller footprint and a carbon neutral goal, in early March 2010, Park Road, installed an ABB Active Voltage Conditioner.

The PCS100 AVC (830 kVA), conditions the power to the whole site rather than just specific segments, ensuring efficiency objectives are met and that responsible energy management is part of day-to-day business.

An inverter based system, the PCS100 AVC protects sensitive industrial and commercial loads from voltage disturbances an innovation providing fast, accurate voltage sag and surge correction, as well as continuous voltage regulation and load voltage compensation.

New Zealand is one of the world's best screen production destinations and is fundamental to the success of the global film industry. Film NZ encourages the screen production industry to use its creativity to seek solutions that deliver both screen success and protection of New Zealand's natural, historical and cultural heritage.



PCS100 Active Voltage Conditioner.



Paremata substation.

Powering the line in Wellington

Photography KiwiRail

ABB-designed traction substations are powering Wellington's new electric rail upgrade, providing the infrastructure to keep the busy commuter network of New Zealand's capital city moving.



A transformer goes in at Woburn substation.



ABB's Aaron Emerson winches the transformer into place.

ABB-designed traction substations are powering Wellington's new electric rail upgrade, providing the infrastructure to keep the busy commuter network of New Zealand's capital city moving.

ABB secured the contract from KiwiRail to design, procure, install, test and commission eleven traction substations to supply a more robust, reliable and safe power system for the new state-of-the-art Matangi trains. This project is part of the largest upgrade of the Wellington electrified rail network in 60 years.

Utilising the strength of its global expertise, industry relationships, and experience with electric train and tram technologies, ABB designed a system specifically for the unique New Zealand operating environment. Few companies in the world have DC traction experience or manufacturing design capability, and recent experience with Australian tram systems made ABB an attractive option for KiwiRail.

DC design expertise was provided by ABB in Australia, and ABB products were sourced worldwide, including 11 kV switchgear from Malaysia, auxiliary transformers from Korea, and DC rectifier, switchgear and OVPD from Switzerland. These were utilised on the ground with locally sourced products and AC design and installation knowledge.

The eleven new substations complement 15 older ones already in operation. These stretch from Upper Hutt, into Wellington, then out to Waikanae. The new substations are fully remotely operated and monitored, with cutting-edge protection systems and SCADA control. Each is powered from the grid by 11 kV AC and provide 1500 V DC to the tracks. To strengthen the existing substations, ABB also provided cabling and switchgear upgrades. The project had a total value of around \$22 million.

From tendering, through to project completion, ABB worked quickly and efficiently to respond to the customer's needs. Apart from a relatively short timeframe, working with so much cutting-edge technology in such a unique environment brought its share of challenges. ABB quickly established a reputation for being a problem-solving organisation, able to manage issues that were encountered, and undertake extra work as the project evolved. ABB's ability to be responsive was largely due to careful planning and design. ABB-designed systems coped well with the necessary adjustments that were made along the way. On-site, ABB's construction manager, was able to deal with any problems as soon as they arose.

David Gordon, KiwiRail's Project Director for the Wellington rail network upgrade, was impressed with ABB's work. "From the beginning of the contract through to commissioning, ABB was attentive to the detail of what was required, and diligent in their design, construction and testing." ABB's people made the project straightforward. "ABB was an extremely enjoyable company to work with," says Gordon, "and helped foster an excellent team environment with the project engineers and KiwiRail."

ABB successfully commissioned the new substations and formally handed them over to KiwiRail within the expected timeframe. This was achieved with an excellent safety record and zero impact on customer operations. Wellington commuters can now enjoy the latest in rail technology, on a transport network powered by ABB expertise.

Loud and proud



Dressed in loud and garish clothing, ABB employees get into the spirit of Loud Shirt Day in September.

Each year ABB proudly supports Loud Shirt Day, the annual appeal of The Hearing House and the Southern Cochlear Implant Paediatric Programme (SCIPP), two charities that work with deaf and hearing impaired children.

All the money contributed by employees is matched dollar-for-dollar by ABB.

This year ABB and its employees contributed approximately \$1,300 to the worthy cause.

CPIT signs agreement with ABB

Christchurch Polytechnic Institute of Technology (CPIT) has enhanced its electrical engineering education and training capability thanks ABB. ABB is supporting the institute by supplying Programmable Logic Controllers (PLC), Human Machine Interface (HMI) and Supervisory Control & Data Acquisition (SCADA) equipment.

David Maples of CPIT's School of Engineering, says the contract will result in students being able to use the same cutting edge systems as currently used in the electrical engineering and general automation industries.

"This will allow our students to experience the current industrial equipment and become more familiar with industrial standard equipment in a safe training environment," says Maples.

"Ultimately, this will make our graduates more employable and sought after by industry."



Adrian Burden (left): Local Product Group Manager for ABB's PLC products in New Zealand, seals the deal with CPIT's Acting CEO Darren Mitchell.

ABB's safety focus



As well as a home safety observation tour competition, ABB sites ran initiatives such as basic first aid training from St Johns.

ABB held its annual NZ safety week, in September, in conjunction with ACC's annual 'Safety at home' campaign. This year ABB's theme was "Taking safety home".

In addition to the many local and global ABB occupational health and safety initiatives run throughout the year focusing on health and safety in the workplace, ABB used this week to provide information, tips and awareness for employees to use at home.

New products

Read about the latest Low voltage products in the market – helping ensure reliability and safety.

Low voltage products

Arc Guard System™ – TVOC-2

New generation of Arc Guard protection

Everyday throughout the world, hundreds of people face serious injuries or death due to arc fault incidents. What's more, this is not only restricted to countries with low safety standards.

A new generation of ABB's Arc Guard System™ has now been released on the New Zealand market, replacing the old generation that served as a benchmark for the past 35 years. With TVOC-2, we set an entirely new standard.

As reliable and simple as the previous Arc Guard system, TVOC-2 is now introduced with additional and improved features and functions. To meet the demands of our customers and end-users, it focuses on reliability, flexibility and simplicity.

Furthermore, with the exclusive functional safety (SIL 2) design, TVOC-2 is approved for today's applications as well as tomorrow's industry needs.

Further info: lvproducts@nz.abb.com



Advantages

- Pre-calibrated optical sensors
- HMI can be mounted on the panel door
- User-friendly start-up menu
- DIN rail or wall-mounted
- Easy to expand as the switchgear grows

Low voltage products

STAR contactors

Keep your motor running



Advantages

- Simplicity for design
- Improved availability and service
- Energy efficiency, sustainability
- Improved safety and reliability

Even in the toughest of industrial applications where absolute reliability is critical, ABB's innovative new line of motor control and protection devices, up to 18.5 kW / 20 hp, are ready to meet the challenge.

Common issues such as poor network quality from voltage fluctuation or dips will not affect our electronic coil contactors. This unique contactor, suitable for a wide range of both AC and DC supply voltages will help eliminate downtime and outages.

Touch safe features protect against accidental contact avoiding injuries to key personnel.

The reduction of energy consumption and environmental impact has long been at the top of our priorities and our revolutionary design cuts coil consumption by as much as 50% over conventional coil technology, both at closing and holding, dramatically.

Further info: lvproducts@nz.abb.com



Connect renewable power to the grid?

Electricity generated by water, sun and wind is most abundant in remote areas like mountains, deserts or far out at sea. ABB's leading power and automation technologies help renewable power reach about 70 million people by integrating it into electrical grids, sometimes over vast distances. Our effort to harness renewable energy is making power networks smarter, and helping to protect the environment and fight climate change. www.abb.com/betterworld

Naturally.