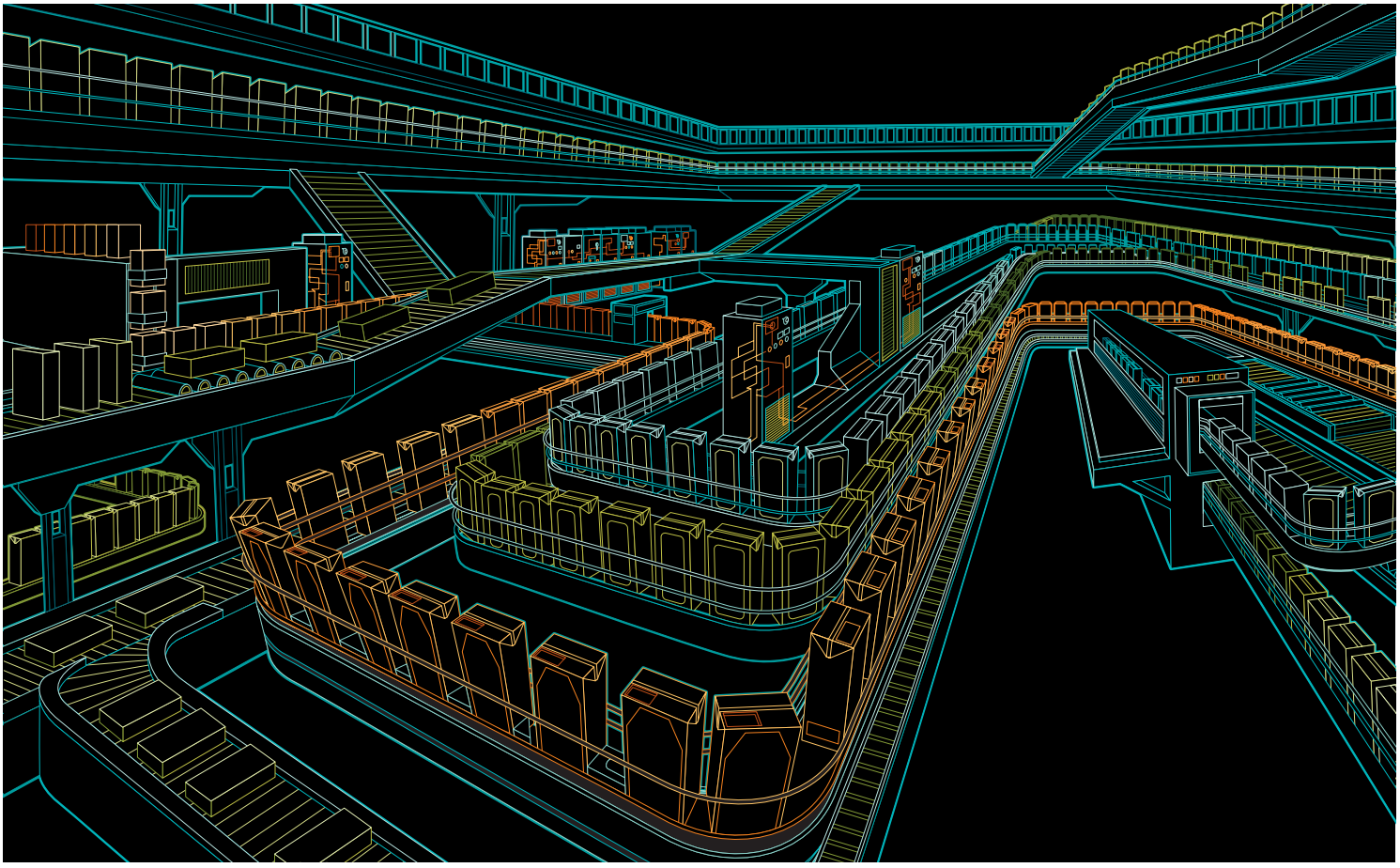
source

2|14
The customer magazine
of the ABB Group
in New Zealand



Process protection

Power and productivity
for a better world™

source 2|14

Ewan Morris
Managing Director
ABB
New Zealand

While power sags, surges and outages can be disruptive in the home, they can also be extremely costly in terms of production disruption for process-driven industries. To maintain seamless and secure operations, a reliable, continuous, high quality power supply is essential for keeping production going and for maintaining product quality.

In this edition of Source, we have good examples of how our power protection technology is helping iconic New Zealand brands like Fonterra and Fisher & Paykel protect their processes and ensure quality output. And, in Fonterra's case, saving significant cost in the process.

One noteworthy aspect of these stories is that much of the technology we are talking about is designed and manufactured in ABB's power protection facility in Napier, New Zealand.

Let me take this opportunity to wish you all a safe and happy holiday season, and we look forward to working with you in 2015.

Source 2/14. Issue 2. November 2014. • Customer magazine from ABB in New Zealand • Copyright 2014 • **Editor:** Tracey Paver • **Tel:** 09 362 1227
Email: tracey.paver@nz.abb.com • **Design:** Sauvage Design • Any use of text or photos requires the written consent of the publisher.

Process protection

Product/system/solution updates

Stories in short

Helping The Merino Company achieve faster machinery speed and production accuracy

Photography ABB generic textiles image

ABB’s drives technology and engineering know-how help The Merino Company’s machinery run 20% faster and improve product quality.

Background

With over 50 years of experience, The Merino Company (TMC), based in Levin, excels in producing high quality, circular knitted fabrics. The company produces 55 tonnes of wool yarn, utilising unique machinery, dubbed a "Wool Rubbing Frame" to change raw merino wool into yarn. The frame machinery was imported from Japan, and all related technical guides and documentation were written in Japanese, which meant understanding this machinery requires not only engineering expertise, but also language translation. Coupled with this, there is only a handful of operators who can properly service and maintain it nationwide.

ABB collaborated with BG Buck Electrical, The Merino Company's main electrical contractors, in early August 2014 to upgrade and retrofit the rubbing frame's machinery following an electrical failure that had halted production. The scope of the project, which was successfully completed in early September, was for the machinery to recommence production as soon as possible, and for it to provide a consistent end product within strict tolerances.

Despite the unique machinery and specifications, and the technical guide language barrier, ABB helped TMC to rectify the machinery failure and resume production. This occurred within two days, initially at a slower operating pace, and the machine was restored to full function within a month. The quick turnaround was crucial, enabling TMC to successfully continue meeting the high volume of customer orders on schedule and to improve the quality of production of their renowned fabrics.

ABB's solution

In place of the failed non-ABB permanent magnet servo motor, servo drive and the machine's main motor drive, ABB installed 5.5 kW and 22 kW ACS880-01 variable speed drives (VSD) and an ABB Baldor permanent magnet servo motor. The work proved to significantly improve the machine's processes as the machinery now runs 20 percent faster. This increase in speed now matches the requested speed machine work, which previously fell out by five meters per minute, and produces more consistent product than the day TMC first acquired the machinery.

Possible fine tuning of the product is in the pipeline, and other machines that require a drive and a motor being considered for upgrade with ABB's VSDs, well-suited to TMC's needs and standards.

Deloitte Energy Awards – ABB's Young Energy Executive of the Year award

Grady Cameron (left) pictured with ABB's Managing Director Ewan Morris.

ABB was proud to have sponsored the Young Energy Executive of the Year award at the annual Deloitte Energy Excellence Awards held in August in Auckland.

Over 630 guests attended the black-tie event which is held to recognise achievement and excellence in the New Zealand energy sector.

Congratulations to Grady Cameron – chief executive officer, Delta Utility Services and Aurora Energy, who won the Young Energy Executive of the Year award, sponsored by ABB.

ABB on social media

Don't forget to like ABB in New Zealand on Facebook for the latest news and information.

ABB is also on Twitter, LinkedIn and has a channel on YouTube.

ABB wins Frost & Sullivan New Zealand Excellence Award

ABB proudly accepted Frost & Sullivan's New Zealand Excellence Award for "2014 New Zealand Energy Management Services Company of the Year" in early September.

ABB's John Penny (back row, third from left) and representatives from each of the other winning categories.

About the 2014 Frost & Sullivan New Zealand Excellence Awards

The inaugural New Zealand Excellence Awards are an annual event to honour companies that have demonstrated outstanding achievement and superior performance in their respective market segments.

"We are very proud to host the annual awards in New Zealand to celebrate the achievements of New Zealand companies. Frost & Sullivan's awards play an important role recognising those who are driving innovation and achieving best practices across various industries in the New Zealand market. This is our first year of awards in New Zealand, and we are pleased to be able to recognise exceptional accomplishments and exemplary achievements in several of the markets we operate in," said Andre Clarke, Country Manager, Frost & Sullivan New Zealand.

Award recipients for the 2014 New Zealand Excellence Awards were identified based on extensive secondary research conducted by Frost & Sullivan's analysts, in-depth interviews and analysis. In order to identify best practices, companies are typically studied on their revenues, market share, capabilities, product or service innovation and overall contribution to the industry.

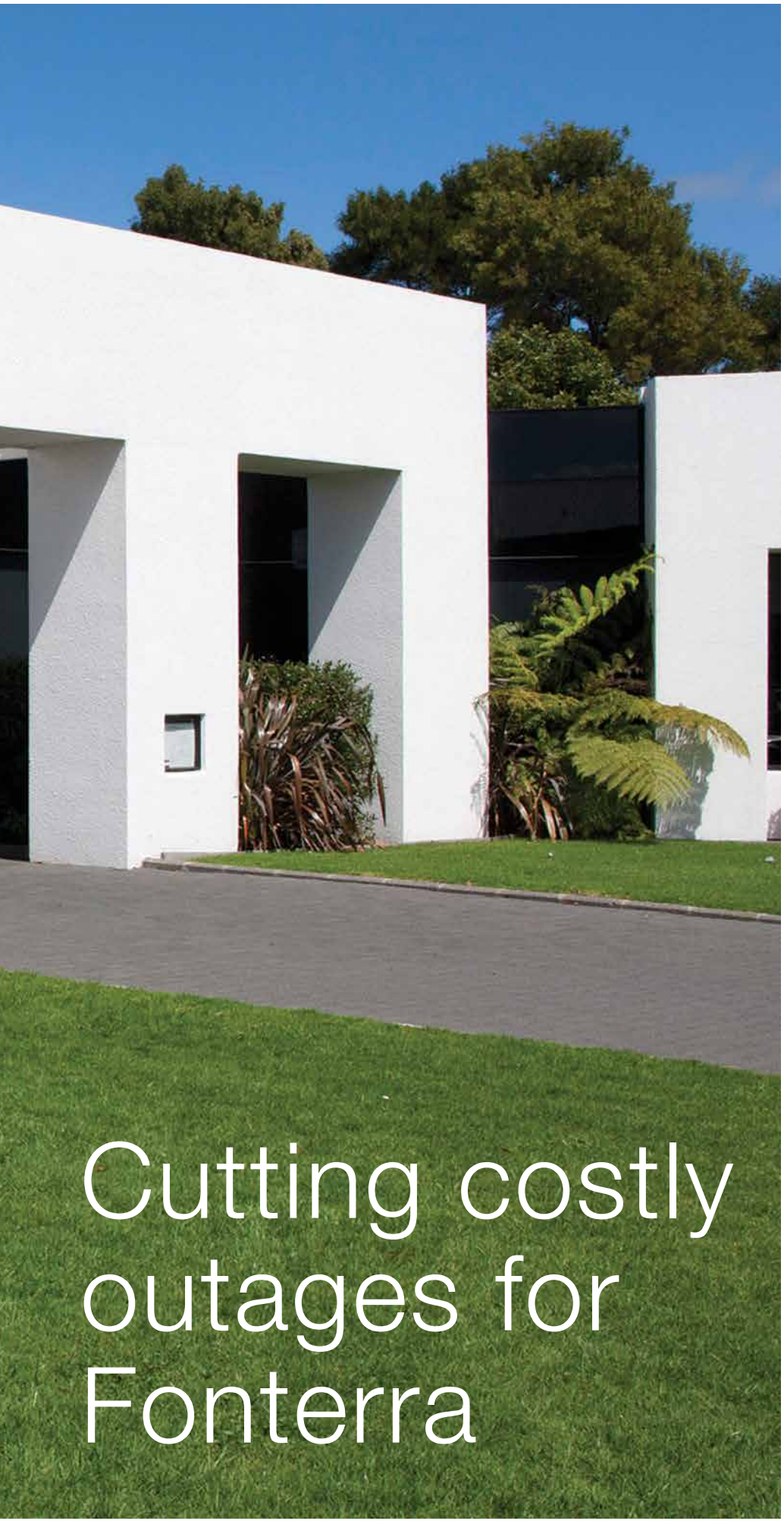
In 2014, the titles were awarded in these main categories:
- Energy
- Environment
- Healthcare
- Information & Communication Technologies

Other category winners included Silver Spring Networks, Datacom and Spark Digital.

You can see the full list of winners, award categories and criteria on – www.frost-apac.com/newzealandawards

The 2014 Frost & Sullivan New Zealand Excellence Awards was held in conjunction with the Growth, Innovation and Leadership (GIL) Congress 2014: New Zealand.


Fonterra
Fonterra Brands
(New Zealand) Ltd



Cutting costly outages for Fonterra

When leading multinational dairy company Fonterra needed a power protection solution for processing and packaging lines at its facility in Takanini, Auckland, ABB was able to provide a solution that would eliminate voltage sags and cut over four power quality events annually, saving an estimated cost of $200,000 per year.

Fonterra's Takanini facility

Globally, Fonterra produces over 22 billion litres of milk each year. This requires the best resources to ensure high quality milk is produced in ways that add real value to Fonterra's customers and consumers around the world. The facility in Auckland produces a number of products, including fresh milk, ultra high temperature (UHT) milk and cultured dairy food for some of New Zealand's best-loved brands. The resources needed to produce these products not only derive from New Zealand's natural environment, but also the equipment used at Fonterra's Takanini facility.

More than 90 percent of UHT milk and cream produced at this facility is exported to markets in the Pacific and Asia region, including China, Singapore and the Philippines. Due to expanding and upgrading processing and packaging capabilities to help meet the significant growth occurring in the global UHT market, the facility now draws between 30 to 40 megawatts of power. This is mainly consumed by the large AC drives and motors used in the facility's production lines, which package more than 750,000 litres of fresh milk each day and can produce around 6.4 bottles per second.

Eliminating costly outages

The production lines are sensitive to voltage sags and short term outages. These short term outages usually range between one to 60 seconds and the value of uncertain energy caused by machinery can result in serious financial loss. When this occurs there is no guarantee the milk is sterilised for consumer use, so disposal or reprocessing of the milk is required. Peter Williams, New Zealand's Fonterra Brand Group Automation and Control Manager, outlines the effect of power quality events. "When a glitch occurs in our facility, we need to go through a sterilisation process which takes around four hours. An event like this across seven production lines, costs us 28 hours of downtime and around $50,000 costs to our business. This would typically happen to us two, three or four times a year."

The PCS100 Active Voltage Conditioner, which is part of ABB's power protection portfolio, is able to eliminate these voltage disturbances in Fonterra's facility, eliminating unwanted downtime and wasted milk product that would ultimately cause a flow on effect to the food and beverage industry. "We would be looking to see savings in the amount of $200,000 a year," says Williams.

A further benefit of the PCS100 AVC is the low total cost of ownership, due to no energy storage requirements and an operating efficiency of 99 percent. With a small footprint in design, the PCS100 AVC was able to fit into the confined area of Fonterra's equipment room, making this an ideal solution for facilities that don't have large amounts of space for their power protection requirements.

Williams indicates that in the future, Fonterra plan to utilise ABB's products to improve power quality in other locations. "Over some time we are looking at using this solution at other UHT sites, just to guarantee the supply stability we need. Our mission is to become the world's most trusted source of nutrition, and ABB's product is a crucial part of that process."

The installed product maintains an operating efficiency of 99 percent.

About Fonterra

Fonterra, the global co-operatively-owned company headquartered in New Zealand's Auckland facility, is the world's largest exporter of dairy products and can be found in over 100 countries.

Counties Power – building for growth

SF6 gas filling of the installed disconnecting circuit breakers (DCB).

Installation and testing of current transformers.

ABB service testing to ensure there are no leaks while filling the DCB.

Counties Power are currently upgrading their Pukekohe substation and building a new substation in Tuakau to keep up with growing demand in the region.

These photos show ABB's disconnecting circuit breakers, current transformers and voltage transformers being installed at Pukekohe substation as part of Counties Power's wider upgrade project; due to be completed in 2015.

Maurice Hoskins of Counties Power said they were attracted to the new disconnecting circuit breakers because they enabled all disconnectors to be removed from the design of the substations: "This significantly reduces outages and maintenance which is a key part of reducing risk and ensuring continuity of supply."

Quality conversion for Fisher & Paykel

Photography Courtesy of Fisher and Paykel

ABB's frequency conversion technology is helping Fisher & Paykel cross international borders seamlessly and cost efficiently with their quality testing for overseas markets.

ABB has installed a PCS100 Static Frequency Converter at Fisher & Paykel's site in Dunedin that will be used to supply stable voltage and frequency during testing of their dishwashers and cooking products, intended for the US market. This includes both design work and life/performance testing of completed products.

Although this application has been adapted in other countries, it is the first PCS100 SFC to be utilised by ABB within New Zealand.

Background

Fisher & Paykel (F&P) export their products to many countries around the world, however all their testing is performed here in New Zealand to ensure quality control is upheld. In order to make this testing comprehensive, F&P needed a solution to convert the voltage in their factory to match the power requirement in other countries.

Due to F&P expanding their operations at their Whiteware Product Development site, the existing inverters did not have the capacity to supply the extra load of the new labs and workshops. To ensure their products are tested to simulate the end-users premises, the existing inverters needed to be replaced with ABB's larger 120 V + 120 V 60 Hz PCS100 SFC. Because the PCS100 SFC was able to convert F&P's voltage (60 Hz) to match the requirement of the country's load (50 Hz in the US specifically), F&P could carry out their testing without any inconsistencies in voltage. This resulted in reduced operating and maintenance costs with high reliability, providing maximum power availability. The PCS100 SFCs small design footprint, enabled it to be installed into a confined space, saving further on costs.

Technology driven

For this project, the PCS100 SFC developed in Napier, New Zealand allows connection of 60 Hz powered equipment to a 50 Hz supply network.

Alternatively, the PCS100 SFC allows connection of 50 Hz powered equipment to a 60 Hz supply network. The system functions by converting the input AC power through a sine-wave rectifier to a DC link, and then through an AC sine-wave inverter to produce a clean, full sine-wave output at the new frequency and voltage.

One unique feature critical to the reliability of the converted output supply is the built-in redundancy capability which is an intrinsic part of the modular system design. In an unlikely event where either a single rectifier or inverter module encounters a fault and stops functioning, the master controller that oversees the power modules will provide a warning notification – while allowing the system to continue to operate.

ABB has a history of selling power conversion equipment to F&P, having sold around 10 units spanning back to 2000. Maurice Cleland, Electronics Technician from F&P, commented on ABB's technology, "We have been very impressed with our previous inverters, and believed that ABB would continue to develop and improve on the existing technology."

Fisher & Paykel

Fisher & Paykel has been designing products since 1934 and has grown into a global company operating in 50 countries and manufacturing in Mexico, Italy, Thailand and New Zealand. Fisher & Paykel products are available in more than 80 countries worldwide. The company's trademarked appliances include Active Smart refrigerators, AeroTech ovens, DishDrawer dishwashers, Smart Drive washing machines and Smartload top loading dryers. The company also manufactures gas and electric cooktops.

New contact centre to improve customer service

In December, ABB is launching a fully-staffed customer contact centre in New Zealand to provide an easy way for customers and business partners to find what they need, particularly if they do not already have an existing ABB contact.

ABB's local customer contact centre covers all units and functions and we have created a more seamless approach to helping our customers – making it easier to do business with ABB.

The 0800 GO 4 ABB number will be available 24/7 and will cater for basic product enquiries right through to plant breakdown emergencies.

John Stewart, Country Service Manager for ABB in New Zealand is heading this customer contact management (CCM) project:

"The contact centre is an integrated approach for capturing, recording, and assigning inquiries or concerns from all stakeholders and giving these to the right people within ABB for quick resolution," said John. "Customer contact management is an important part of making it easier for customers to contact ABB, making sure that inquiries do not get lost."

In addition to managing the 0800 G0 4 ABB number, the customer contact agents will manage enquiries through a centralised email, fax and certain web enquiries.

Phone: 0800 GO 4 ABB (0800 46 4 222) for NZ and +64 7 850 2721 for overseas
Email: contact.centre@nz.abb.com
Fax: +64 7 849 3526
Web: "General enquiries" section under www.abb.co.nz

Providing process improvement potential to Fonterra

Fonterra's desire to further protect the quality of milk pumped from hundreds of tankers nationwide gave ABB the opportunity to prove the performance of its ACS880 variable speed drive (VSD), as part of a trial to reduce any onset of cavitation during the pumping process.

Trial background

Lloyd Darrah, Fonterra's Reliability Team Leader, says if milk was found to be damaged by cavitation during a pumping process, Fonterra wanted to have a proven solution from their approved drives suppliers readily available to solve the problem. As part of a trial, ABB's ACS880 VSD pump control solution was developed, with sophisticated protection algorithms, for Fonterra's Longburn plant in Manawatu. "We wanted to understand how smart drives could control a draining vortex where swirling milk upset the flow," explained Darrah.

While it began as a trial to monitor and control milk quality, Fonterra embraced this opportunity not only to address cavitation issues, but also to improve their overall processes. "As part of the trial, we looked at a variety of factors from vibration analysis on the pumps to foaming tests on milk, which is a consequence of turbulence," said Darrah. He adds that ABB's ACS880 met Fonterra's expectations, as it was able to address not just cavitation, but additional factors relating to pump performance within the drive, giving it more scope for development.

ACS880 features

The ACS880 offers process advantages by solving cavitation locally within the drive; avoiding the additional interface of either a plug-in controller card or an external PLC controlling the plant. The built-in PLC in the drive firmware allows all pump control to become completely sensorless. Potential flow uses are picked up immediately by changes in torque on the shaft, rather than by sensors after they occur, and there is no lag from PLC scan times. The automation system of the ACS880 offers considerable improvement to any process, irrespective of network issues, and there will never be incompatibility issues.

As a result, the drive will control a motor more precisely, taking away variability from calculations. Engineers will then be able to be more aggressive on control, often allowing them to devise better engineered solutions. Such advances, among many more in drive automation, simplify solutions, use fewer external components, take risk out of solution design and are completely configurable for any application.

Read the full article in Electrolink trade magazine (Sept – Oct 2014 edition)

The future of mobility is electric

Besides trains and metros, electric vehicles, including buses, are playing an increasingly large role in modern mobility.

Global agreement combines Volvo Electric and electric hybrid buses with ABB fast-charging solutions, paving the way for rapid deployment of urban e-mobility.

As we speak, Nissan, Mitsubishi, Peugeot and Citroen are currently delivering their first batches of mass-produced electric vehicles (EVs). The momentum of supply and demand of EVs is rising rapidly worldwide.

As electric vehicles, like their fossil fuel siblings, need to refuel, a service industry will inevitably emerge to meet the recharging needs of consumers. With rules governing this industry largely dictated by technical, economic and legislative parameters, ABB believes that IT will be one of the crucial competences required to compete and survive in the electric vehicle recharging industry.

ABB has a detailed whitepaper around this topic, “Towards winning business models for the EV-Charging Industry”, that is available via our website, or you can request a copy by emailing nz.communications@nz.abb.com.

Fast facts:

- Electric vehicles: IHS Automotive forecasts a 67 percent increase in electrified vehicle production globally in 2014, especially driven by strong EV growth in Europe and China.
- Fast chargers: ABB has delivered over 1,500 DC fast charging systems for passenger vehicles worldwide since 2010, rolling out charging networks for automotive, utility, government and retail customers including nationwide networks in the Netherlands, Estonia and Denmark.
- Electric buses: Volvo Buses launched its first hybrid bus in 2009 and has delivered nearly 1,600 hybrids to 21 countries. Volvo’s first fully electric bus will be launched in June 2015 as part of the ElectriCity project in Gothenburg, Sweden.

Latest developments – electric buses

ABB and Volvo form global partnership for electric and hybrid bus fast-charging.

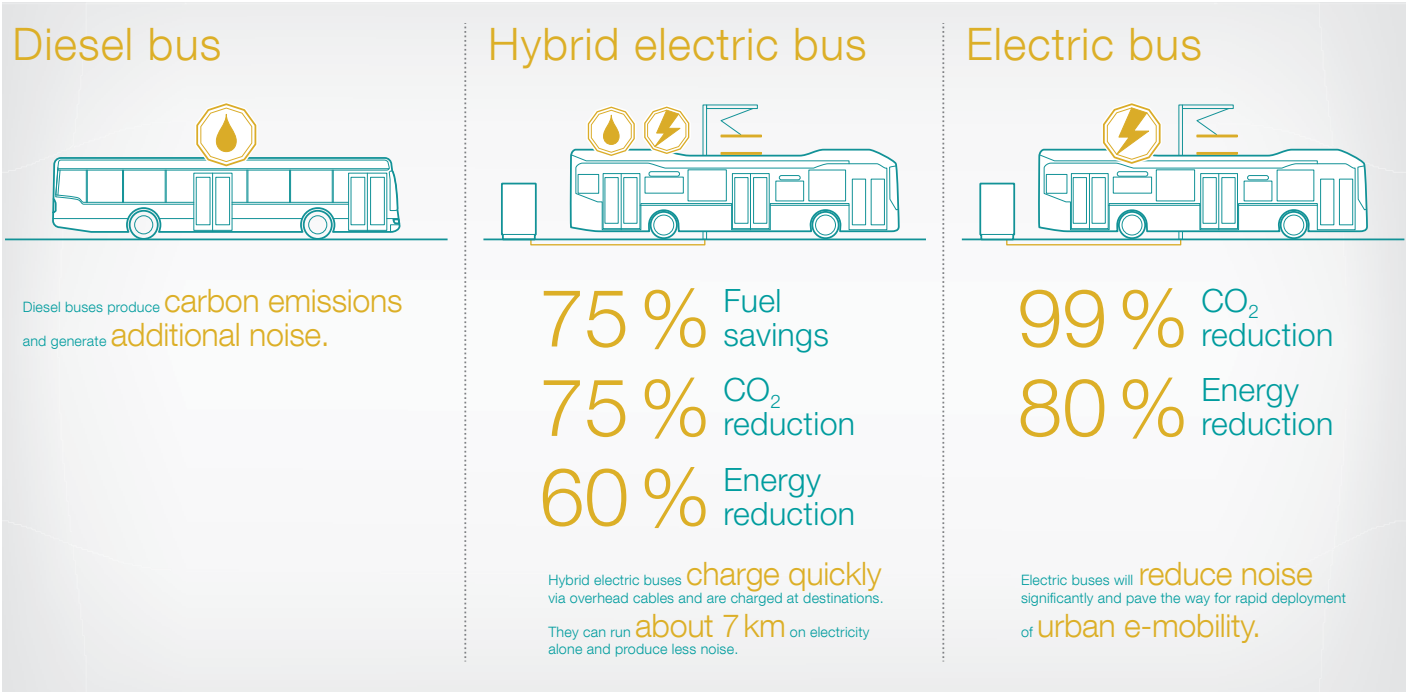


ABB and Volvo Buses, one of the world's leading bus manufacturers, are working together to co-develop and commercialise electric and hybrid buses with open standards-based direct current (DC) fast charging systems.

The cooperation creates a city-wide standardised charging system for electric and electric hybrid buses that can charge buses quickly through an automatic roof-top connection system at bus stops or through cabled charging systems overnight.

This approach, based on internationally accepted standards, enables maximum re-use of existing e-mobility technologies, thereby ensuring a rapid deployment of urban e-mobility. The first joint project for Luxembourg's public transportation system is planned for 2015.

Volvo's new Electric Hybrid bus, which reduces fuel consumption by 75 percent compared to conventional diesel buses, will debut at the IAA exhibition in Hannover, Germany, in September.

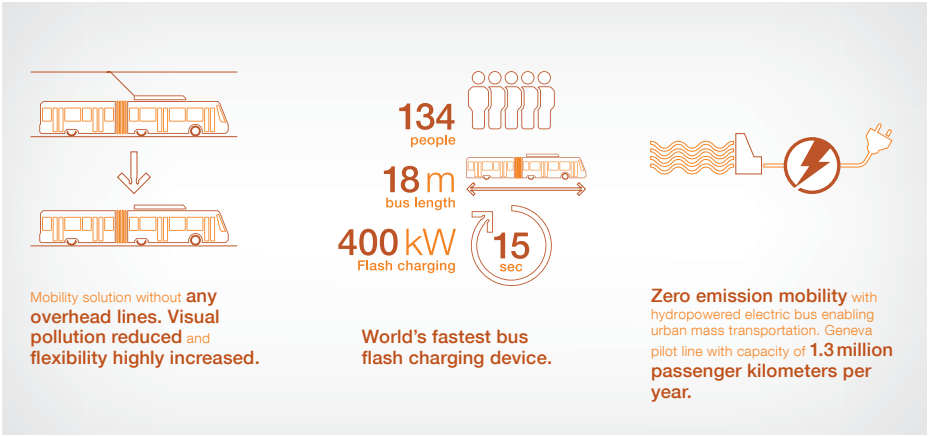
ABB and Volvo will contribute with their respective expertise in power grids and e-buses to further develop e-bus fast-charging standards, such as communications protocols for infrastructure, electrical grids and e-buses.

An electric-bus charging standard will be largely based on the recently adopted global DC fast charging standards for passenger cars, guaranteeing safety and helping stimulate investment, long-term commitment and increased adoption of clean mobility.

The partnership is focused squarely on standardisation of automatic e-bus fast charging, including the communications protocol between the infrastructure charging solution and e-bus, the electrical interface and specifications for the rooftop automatic connection system (ACS).

"We are delighted to enter into partnership with ABB. Together, we have a complete and competitive offer to cities around the world that want to switch to a sustainable public transport system," said Håkan Agnevall, President Volvo Buses. "Electric hybrid buses and full-electric buses are tomorrow's solution for urban public transport."

ABB demonstrates technology to power flash charging electric bus in 15 seconds



No overhead lines and ultrafast charging times at selected bus stops enable new opportunities for next generation silent, flexible, zero-emissions urban mass transportation.

ABB has developed a new technology that will help power the world's first high-capacity flash charging electric bus system.

ABB announced that it is working together with Geneva, Switzerland's public transport company (TGP), the Office for the Promotion of Industries and Technologies (OPI) and the Geneva power utility SIG on the TOSA electric bus system pilot project.

The new boost charging technology will be deployed for the first time on a large capacity electric bus, carrying as many as 135 passengers. The bus will be charged directly at selected stops with a 15-second energy boost while the passengers enter and leave the bus, based on a new type of automatic flash-charging mechanism. The pilot project runs between Geneva airport and the city's international exhibition centre, Palexpo.

TOSA (Trolleybus Optimisation Système Alimentation) is a zero-carbon-emission solution as the electricity used comes entirely from clean hydro power. The charging time is so quick that it does not interfere with the bus schedule and improves the urban environment and landscape as it does not need overhead lines while providing greater route flexibility. The system uses a laser-controlled moving arm, which connects to an overhead receptacle for charging at bus shelters, instead of the usual trolley poles to overhead lines.

The flash-charging technology and the onboard traction equipment used in this project were developed by ABB and optimized for high-frequency bus routes in key urban areas, carrying large numbers of passengers at peak times. Onboard batteries can be charged in 15 seconds with a 400 kilowatt boost at selected stops. At the end of the bus line a three to four minute boost enables the full recharge of the batteries. Thanks to an innovative electrical drive system, energy from the roof-mounted charging equipment can be stored in compact batteries, along with the vehicle's braking energy, powering both the bus and its auxiliary services, such as interior lighting.

Auckland University Engineering field trip to Henderson plant

Around 20 Auckland University Engineering students, a mix of electrical, mechanical and mechatronics majors, took advantage of a field trip to ABB's medium switchgear facility in Henderson, Auckland. The trip was jointly organised by ABB and the IEEE Auckland student branch, of which ABB is proud to be the principal sponsor.

The students were taken on a tour of the plant by one of two key engineering managers, and were given the opportunity to ask questions on the tour, or during a networking lunch.

ABB has been designing and manufacturing medium voltage secondary switchgear for over 30 years, and currently produces the SafeLink switchgear product for a local and international market, including Australia, Netherlands and Jordan.

ABB's senior engineering managers hosted the tour.

New products

Robotics

YuMi®

The future of human-robot collaboration

ABB's innovative human-friendly dual arm robot with breakthrough functionality will unlock vast global additional automation potential in industry.

YuMi is a human-friendly dual arm robot designed for a new era of automation, for example in small parts assembly, where people and robots work hand-in-hand on the same tasks. YuMi is short for 'you and me,' working together.

YuMi has been developed to meet the flexible and agile production needs of the consumer electronics industry in the first instance. It will increasingly be rolled out to cover other market sectors. YuMi is a collaborative, dual arm assembly solution with the ability to feel and see. The robot's soft, padded dual arms, combined with innovative force-sensing technology ensure the safety of YuMi's human coworkers.

The official market launch of YuMi will be in April 2015 at Hanover Fair.

Further info: www.abb.com/robotics

Advantages

- Inbuilt safety, therefore robot can work cage-free
- Capable of handling everything from the delicate and precise parts of a mechanical wristwatch to the components used in mobile phones, tablets and desktop PCs
- YuMi performs with accuracy so great it can thread a needle

Measurement Products

AquaMaster 3

Remote water metering made easy, now with a renewable energy component

The AquaMaster 3 is a precision solution for remote water metering and irrigation applications. As a total solution for flow measurement in the potable water industry, it boasts outstanding performance, innovative features and low cost of ownership, making it the first choice for leakage management, district metering, bulk revenue and trunk mains applications.

In addition to its design of mains and battery-powered transmitter, the AquaMaster 3 has a new addition of a renewable energy component, utilising a simple DC connection (6 to 22 V) from sources as small as a 5 W solar panel, the first of its kind in its market. Its various power supply option make it the most appropriate flow meter, especially in remote areas where power supply access is inconvenient.
Further convenience is available with remote access via mobile phone technology over quad-band GSM networks by SMS text message or GPRS (WITS).

Further info: Search for the AquaMaster 3 on www.abb.com

Advantages

- Power supply sources: AC mains, external long-life battery pack, internal standard lithium D-cell battery and solar / wind power
- Zero maintenance: Sealed for life, zero water ingress, even during flood conditions
- Retains battery power: holds power for up to five days once fully charged
- Logged data storage: high resolution data facilitates step testing, leakage detection and water network analysis
- Fit-and-Flow data storage: eliminates the need to match sensor and transmitter in the field as a self-configuration sequence automatically replicates all settings on initial installation which eliminates the possibility of error

Every change, every risk, every challenge. Every. Thing. Controlled.

In the dairy industry, consumer demands change constantly. A trend towards more products, in smaller batches, requires strict adherence to production schedules and tighter integration with logistics. Coupled with rising costs and the need to meet rigorous new food safety standards, it's a business that has become more complex, precisely at a time when it needs to be more nimble. ABB's tireless commitment to process innovation can offer major performance improvements. Whether you choose to talk directly to us, or to one of our ABB Authorized value providers, you can rest assured that everything is controlled. Every change, every input, every sample, every drop, every risk, challenge. www.abb.com/dairy

Power and productivity
for a better world™

ABB