Improving business operations for Sydney Ferries

ABB achieves another milestone in substation automation  4
First commercial installation of IEC 61850-9-2 process bus technology
ABB acquires Tropos  5
Acquisition enhances wireless communications offering
Substation automation for world’s largest thin-film solar plant  7
MicroSCADA Pro™ to improve reliability and reduce maintenance costs
Dear readers,

In this quarter’s newsletter, you will see there’s been a lot going on in the world of network management.

Perhaps the most exciting development was our acquisition of Tropos, a Silicon Valley-based company, specializing in wireless technology and products for distribution area communications networks. Tropos will extend our offering for mission-critical applications in the power distribution sector, and enable us to serve customers in transportation, mining and municipal services.

Elsewhere, we have completed a number of exciting projects, including a deployment of Ventyx software, to improve business operation for Sydney Ferries, and a MicroSCADA Pro system to control the lighting at Helsinki’s museum of modern art, Kiasma.

We also bring news of the technology milestone we achieved in Australia with the first commercial implementation of IEC61850-9-2, the most advanced global standard for substation automation. This will improve automation and availability in a key substation serving south-east Queensland and help Australian utility Powerlink to meet the needs of its customers long into the future.

As always, we continue to collaborate with our customers and partners, holding demonstration sessions to highlight advances in our portfolio, and helping to establish the best solutions for our customers. From improving business operations in Australia to helping to deliver emergency power in Japan, we strive to help our customers meet complex needs with practical solutions in every corner of the world.

Enjoy this edition of the newsletter and contact us to learn more about how we can help to improve your business and operations.

Best regards,
News

4  ABB achieves another milestone in smart substation automation
First commercial installation of IEC 61850-9-2 process bus technology

5  ABB acquires Tropos to enhance wireless communications offering
Acquisition extends capability for distribution automation and provides enhanced support for mission-critical applications

Projects

6  Sydney Ferries: Major improvements for business processes with ABB enterprise software
Deployment supports safety and reliability of metropolitan ferry fleet serving more than 14 million passengers annually

7  Smart grid learning continues with ABB collaboration in Denmark
The Danish Technical University uses ABB’s Network Management System for smart grid development

8  ABB lighting control at Kiasma, Helsinki’s museum of modern art
MicroSCADA Pro works like a charm, helping to manage lighting in both exhibition areas and work spaces

Collaboration

9  UK event demonstrates network management portfolio to customers
Sessions held on protection and control; RTUs and communications in ABB’s System Verification Area in the UK

10  ABB helps APR Energy deliver emergency power in Japan
ABB’s substation automation products enable EPC to design and rapidly deploy two turnkey power plants providing more than 200MW of emergency power

Innovation

11  Advanced generator protection
New accessories for ABB’s generator protection IED, REG670
ABB has completed its first commercial substation automation system using IEC 61850-9-2 process bus technology. The new standard-compliant system, installed for the Australian utility, Powerlink, provides advanced automation functions to enhance availability and reliability at Loganlea, a key substation serving south-east Queensland, a fast-growing region of Australia.

IEC 61850-9-2 process bus, based on the international substation automation standard IEC 61850, enables current and voltage measurements to be transmitted to protection and control devices via a fiber-optic communication network, resulting in increased safety and reduced copper cabling.

The process bus also supports the standardized integration of non-conventional instrument transformers (NCITs), bringing performance improvements and further reductions in cost and space requirements. NCITs dramatically improve safety because they eliminate the risk of voltage hazards, which can arise in conventional transformer circuits.

The refurbishment project at Loganlea Substation has seen the replacement of the ABB proprietary communication to the existing NCITs with a smart substation automation protection and control system, with ABB’s Relion-series and REB500 IEDs, featuring the world’s first conformance-tested IEC 61850-9-2 merging units and ABB’s protection and control IEDs (intelligent electronic devices). These deliveries bring Loganlea Substation into full compliance with the most advanced global standard for substation automation, maximizing availability and grid reliability.

"With demand for electricity growing fast, Queensland needs to further build on long-term, cost-effective solutions for its power system," said Jens Birgersson, Head of ABB’s Network Management business unit. “By upgrading the substation with advanced automation and the latest communications standards, we will help Powerlink to fulfill its strategy well into the future.”

Completion of the Loganlea project demonstrates ABB’s expertise and best-in-class technologies for world-leading advances in substation automation.

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ABB acquires Tropos to enhance wireless communications offering

Acquisition extends capability for distribution automation and provides enhanced support for mission-critical applications

This quarter saw ABB expand its business with the acquisition of Tropos Networks Inc., a Silicon Valley-based company that develops and markets wireless technologies and products for distribution area communication networks.

The acquisition will expand ABB’s communications systems offering for customers in the power, transportation, mining and public infrastructure sectors.

Based in Sunnyvale, California, Tropos employs 55 people. The company’s wireless IP (Internet Protocol) broadband solutions focus on reliability, security and scalability, key characteristics for essential services in smart grid and other outdoor industrial applications.

The Tropos portfolio extends ABB’s existing offering of communications solutions for the power distribution sector. It also reinforces ABB’s increased focus on the North American market and complements its global presence in utility and industrial communications.

As power grids and other critical infrastructure become increasingly reliant on automation, demand for cost-effective, reliable and secure communication solutions is growing. Communications play a critical role in realizing the efficiency improvements that can be achieved by automation and improved resource allocation.

“Tropos Networks’ technologies are a great fit with our own communications offering, greatly increasing our ability to supply robust and reliable private networks for use in mission-critical applications,” said Jens Birgersson, head of ABB’s Network Management business, a part of the company’s Power Systems division.

“For Tropos, joining ABB will accelerate our ability to reach customers in new geographies and industrial sectors.”

ABB’s comprehensive suite of communication solutions provides a strong foundation for mission-critical networks and is a key enabler for smarter grids. Solutions for fixed-wire, narrowband, broadband and wireless connections play an important role in ensuring the reliability of modern power systems.

The transaction closed on June 15, 2012.

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ABB’s newest team celebrates in Sunnyvale at the Tropos Wireless Research Center, ABB’s center of excellence for wireless communications. ABB customers will benefit from the combination of Tropos’ wireless communications technologies and ABB’s automation solutions, and system design and implementation services.
Sydney Ferries: Major improvements for business processes with ABB enterprise software

Deployment supports safety and reliability of metropolitan ferry fleet serving more than 14 million passengers annually

For more than 135 years, ferry services have played a vital role in Sydney’s public transport system. The city’s unique geography, with extensive waterways and peninsula suburbs, means ferries are often the quickest and most efficient transport mode for commuters. However, Sydney Ferries had recognized constraints in fulfilling its potential due to an aging, complex fleet and outdated systems and processes.

Sydney Ferries faces a number of challenges maintaining its vessels. One is the age of the fleet, which was constructed between the 1950s and 2002. Another is meeting the rigorous auditing and reporting requirements of the regulatory body NSW Maritime. A third challenge is the tough conditions in which the ferries operate – always in salt water, and with just four backup vessels – each for a different use – Sydney Ferries cannot afford for more than one ferry to break down unexpectedly.

Over the past five years, Sydney Ferries has undertaken a program of reform, which has led to major improvements in its service and created a larger role for ferries in Sydney’s integrated transport system. A significant contributor to the improvements in efficiency, safety and reliability is the company’s asset management system.

Said Alexander Colvin, program manager at Sydney Ferries, “We didn’t want to just upgrade our systems for the sake of it, and simply choose one or two new applications because they fit nicely with how we currently operated. We were embarking on a major business transformation with the view to make significant improvements to our service availability, reliability and on-time running of our ferries.”

Ventyx, ABB’s enterprise software business, helped Sydney Ferries to upgrade its Enterprise Asset Management (EAM) and Enterprise Resource Planning (ERP) software, Ventyx Ellipse. Other Ventyx solutions implemented include Ventyx Critical Inventory Optimization, to improve procurement of stock items and reduce inventory holdings, and Ventyx’s hosted business-to-business procurement solution, replacing manually printed purchasing forms and enforcing government-delegated authority rules.

Since the review, improvements to Sydney Ferries’ business include:

- Vessel availability (the proportion of the fleet which is available for service increased dramatically, up to 90 percent from 71 percent five years ago.
- Despite the age and complexity of Sydney Ferries’ fleet, vessel reliability increased for a fifth-consecutive year to reach 98 percent.
- Improved vessel maintenance and risk-management strategies have also reduced vessel groundings and collisions, from 18 (2006/7) to three (2010/11).
- Since the implementation of Ventyx Critical Inventory Optimization, Sydney Ferries has reduced its inventory by 10 percent over 12 months.
- Due to better planned maintenance, the proportion of vessels which remain in service without withdrawal due to mechanical failure is at 96.5 percent, up from 91 percent in 2005/6.

“With the improvements we’ve made to our procurement systems, vessel maintenance and inventory management, we’ve made more progress in the last few years than we have in the last 20,” said Colvin.

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According to the latest mapping of the Danish smart grid sector by the Copenhagen Cleantech Cluster (CCC), there are 60 smart grid firms, including ABB, with a total of 15,500 employees working on different aspects of the smart grid concept. These companies represent 22 percent of all testing and demonstration projects in Europe, which is twice as much as in Germany, while Spain represents 8.7 percent.

ABB is actively collaborating in this exciting sector. Denmark is one of the leaders in the control and management systems required to balance the energy supplied by volatile renewable sources, such as wind and solar power, with its consumption during peak demand periods. And ABB is the market and technology leader in network management.

Testing facilities are a vital component to demonstrate and refine tomorrow’s smart grid systems. The recently opened PowerLabDK at the Danish Technical University is one of the best research platforms in the world – a large-scale test and teaching laboratory where ABB’s Ventyx Network Management System is being applied to enable different stakeholders to develop intelligent power systems for the future.

At PowerLabDK’s inauguration ceremony, Martin Lidegaard, Minister for Climate, Energy and Building, and Jacob Østergaard, professor and center director at the Danish Technical University (DTU), emphasized the importance of having the “full picture of the necessary solutions” in an electric power system with a very high proportion of renewable energy – and the importance of this knowledge for the development of good future products and solutions. For this reason, research, development, and testing are essential components for the power systems of the future.

In the field of R&D, ABB has decades of experience and has always been on the leading edge of power technology. In February 2012, ABB inaugurated a new Smart Lab at its Dalmine facility in Italy to simulate and study, with real components, the behavior of components in low- and medium-voltage intelligent networks.

A month later, in March, ABB’s new Smart Grid Center of Excellence was opened in North Carolina in the United States. The nation’s first-of-its-kind demonstration center and testing lab, which uses cutting-edge smart grid software and equipment in an integrated approach to illustrate to electric utilities, co-ops, municipalities, and other electricity providers, how the latest Smart Grid technology can play a vital role in severe weather management for entire cities.

“This increased collaboration reafirms ABB’s commitment to provide best in class smart grid solutions and enables the development of tomorrow’s power systems for a reliable and sustainable energy supply,” said Jochen Kreusel, Head of the ISI Smart Grids.

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ABBB lighting control at Kiasma, Helsinki’s museum of modern art

MicroSCADA Pro works like a charm, helping to manage lighting in both exhibition areas and work spaces

Located in central Helsinki, Kiasma is home to the contemporary art collection of Finland’s National gallery. Its ultra-modern architecture and program of exhibitions, workshops, and theatrical performances, have made it a magnet for contemporary artists from around the world. Now, thanks to an ABB monitoring and control system, visitors, artists and employees are assured of optimal lighting throughout the building.

The museum, which has more than 9’000 square meters of exhibition space, was completed in 1998. Almost 8’000 works of art are in the building, on display or in storage facilities. By 2011, its automation systems were nearing the end of their lives and Kiasma chose to replace them with ABB’s intelligent KNX building automation products. MicroSCADA Pro was chosen as the user interface for the lighting system.

The museum needed to manage lighting in both exhibition areas and work spaces, which pose very different challenges, and each exhibition requires a unique lighting scheme to ensure that the desired affect is achieved. "Many artists have very detailed requirements," said Matti Leino, exhibition technician for Kiasma’s exhibitions. The lighting also needed to be automated for activation at specific times and in specific ways, as well as shutting down in areas that are not in use. Achieving all this with the necessary levels of precision and reliability was a challenging task.

ABB’s MicroSCADA Pro software allows operators to program specific lighting schedules for different rooms via a convenient user interface, accessible from a laptop. “We can see instantly what the lighting will look like and then modify it to get exactly what the artist wants," said Leino. “Then we can store the settings and link them up to the time-based controls. It’s easy to use and very reliable; and we’ll be able to adapt it as our needs change.”

Leino worked closely with ABB project manager, Achim Behr, on the design of the user interface. Together, they created a logical system of menus and commands, optimized for the needs of the museum, and he’s very pleased with the results:

“This was the first time in 11 years that no one called me in the summer holidays to complain about lighting problems," he said with a smile. “Everything works perfectly and we’re set for another 15 years.”

“ABB’s automation products have also been installed in neighboring facilities. In the Helsinki Music Center, the city’s new purpose-built concert hall, ABB’s intelligent building system controls not only the lighting, but also the smoke extractor system.

In the headquarters of the leading Nordic media group, Sanoma, which is just down the road, ABB’s MicroSCADA Pro monitors and controls electricity use, as well as the elevators and uninterruptable power supply (UPS) devices.

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UK event demonstrates network management portfolio to customers

Sessions held on protection and control; RTUs and communications in ABB’s System Verification Area in the UK

An event held recently at ABB’s System Verification Area (SVA) in Stone in the UK brought customers and ABB experts together to discuss advances in our network management portfolio. Run by ABB’s UK Power Systems Network Management team, the event was an opportunity for new and existing customers to participate in active discussions and hands-on demonstrations of ABB products.

“The aim of the event was to show customers how our products can contribute to their core businesses,” said Andy Osiecki, General Manager – Power Systems Network Management in the UK. “It attracted 30 participants from a broad spectrum of applications, including distribution network operators (DNOs), general industry and railway infrastructure. Some of the delegates were from companies that already do business with other parts of ABB; others were new contacts, keen to hear how ABB can make a difference.”

The event was focused on helping delegates to increase their understanding of some of the key current issues in the network management industry through a series of sessions on topics such as: protection and control; remote terminal units (RTUs) and communications.

Naturally, there was special focus on the global IEC 61850 standard that represents a major step forward in simplifying the integration of intelligent electronic devices (IEDs).

During the day, delegates were also able to see the operation of the automated System Verification Simulator (SVS). Rather than carrying out manual switching of equipment to simulate the operation of substation plant, the SVS is able to replicate the whole substation within the test environment. It runs automated, self-monitoring test sequences to provide a high level of rigor and repeatability, as well as a full audit trail. Confirming the operation of the complete system off-line significantly reduces the chance of failure in the field, minimizing risk for the customer.

Andy Osiecki summarized the day: ‘It was a very positive experience. The feedback we had was that customers went away with a much greater appreciation of ABB’s expertise and comprehensive range of network management solutions. They especially appreciated the demonstration board and that has now become a permanent fixture at the Stone SVA.”

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ABB hosts a number of events through the year to help customers and partners to keep up to date with new developments in the portfolio.

Hands on demonstrations showed ABB products in action.

Network Management newsletter 2|12 9
ABB helps APR Energy deliver emergency power in Japan

The flexible and integrated nature of ABB’s substation automation product portfolio delivered key support to the rapid deployment of two turnkey power plants, providing more than 200MW of emergency power.

APR Energy LLC (APR), headquartered in Jacksonville, Florida, in the United states, is a leading provider of major turnkey temporary power generation services.

APR Energy’s systems are capable of delivering power for peak shaving and seasonal solutions, and distributed generation for areas with limited generation capacity. Their systems also provide grid stability and support for networks in need of reactive power. In addition, APR Energy also provides emergency generation capacity for disaster relief and unscheduled outages.

Following the tragic earthquake and tsunami that hit Japan on March 11, 2011, APR was contracted by Tokyo Electric Power Company, Inc. (TEPCO) to provide a fast-track power solution capable of providing 203MW of additional electricity to two Japanese cities, Yokosuka and Hitachinaka. APR Energy’s solution included mobile gas turbines in combination with diesel power modules, on-site operations and maintenance services with a commitment to commission both installations in less than 45 days.

APR Energy’s rapid deployment approach is based upon modular equipment to enable the fast-track transportation, installation and commissioning of the generator sets, fuel tanks and primary electrical equipment including: switchgear, breakers and transformers.

At the time of the Japanese disaster, ABB was already working with APR on the development of a pilot 8MW modular substation and centralized control system based on the international standard for substation automation, IEC 61850. This pilot incorporated compact gas insulated switchgear (GIS), Relion® protection and control IEDs and MicroSCADA Pro substation automation software running on a SYS600C station computer. Based on the success of the factory acceptance testing (FAT) for this 8MW pilot project, APR decided to...
INNOVATION

APR Energy offers temporary power solutions on a fast-track basis to government and industrial customers around the globe.

APR first became interested in Relion relays because they are integrated into ABB’s compact GIS. APR found the integrated GIS and protection and control system well suited to their turnkey rapid deployment power system solution. The IEC 61850 compliant designs enable rapid deployment and replication of IED configurations and station controller HMIs. The design flexibility and multi-object, multi-function capability of the Relion platform reduces hardware footprint and minimizes supporting infrastructure.

In addition to the hardware advantages, ABB’s global presence provided the necessary support to deliver both equipment and technical support on an extremely tight time line. Relion relays in China were quickly adapted for local needs and were drop-shipped to Japan.

At the same time, technical resources in the United States were working with APR engineers at their Florida facility to engineer a MicroSCADA Pro system based on the planned relay configuration. This used an ABB-developed simulator tool that enables the station control and HMI to be developed without the physical presence of the relays.

Finally, ABB engineers joined APR engineers on-site in Japan for the final commissioning of the power generation system.

The final APR Energy system delivered to Japan included Relion 615, 630 and 650 IEDs as well as a customized design for the MicroSCADA Pro local HMI.

The collaborative relationship between APR and ABB, combined with ABB’s flexible and robust substation automation portfolio, enabled APR to meet a tight development and delivery schedule, stay on budget and deliver essential additional electric capacity to a country in need.

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ABB’s generator protection REG670 IEDs (Intelligent Electronic Devices) belong to the Relion® protection and control product family, which offers a wide range of products for the protection, control, measurement and supervision of generators, transformers, power lines, etc. in a wide range of applications. To ensure interoperable and future-proof solutions, Relion products have been designed to implement the core values of the IEC 61850 standard.

The REG670 has now been enhanced to feature an innovative 100 percent stator earth-fault protection and a sensitive rotor earth-fault protection, both based on an injection principle. When the REG670’s injection-based stator protection is used, 100 percent of the machine stator winding, including the star point, is protected under all operating modes, even at machine standstill. This new feature makes the REG670 suitable also for very complicated and challenging installations, such as pump-storage power plants and large hydro and turbo machines.

Further, a stator injection signal with a frequency higher than the power system frequency is used (e.g. 87 Hz signal in a 50 Hz power system). This confers many practical advantages. In addition, a special tool module (Injection Commissioning) accessed via the CM600 protection and control IED manager significantly simplifies the installation and commissioning of the injection-based stator and rotor earth-fault protection functions.

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Advanced generator protection

REG670 with its new accessories for injection-based stator and rotor earth fault protection.