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Dear readers,

In this fourth edition of our customer newsletter, you will find more stories about the projects we delivered and orders we received in 2011.

November saw the first deliveries of ABB substation automation products for the upgrade of Bangalore’s extensive distribution system where our RTUs will help to ensure the reliability of power supplies on which this city depends. ABB RTUs also feature in our Neptuno irrigation control systems, which are helping Spanish farmers to optimize water consumption and maximize productivity, while reducing trips to the field through the use of mobile communications.

Our continuing support for customers in North America is highlighted in an article on our substation automation business in this important market.

In the last quarter of the year, we released a new version of our Network Manager software, which now includes a volt/VAR optimization application, and we launched EV Transmission, a tool to help traders better understand the role of transmission in North American power markets. Both of these new products come from Ventyx, our dedicated software business, which, along with recently acquired Mincom, continues to broaden our offering to asset intensive industries.

As the integration of Mincom progresses, it is business as usual for our customers in the mining sector and our latest survey of opinions in the global mining industry was published in November. A summary is presented here, along with links to the full survey, accessible online.

This issue brings another busy year to a close and we look forward to working with you again in the year to come. We wish you all a prosperous and productive 2012.

Jens Birgersson

Jens Birgersson
Business Unit Manager Network Management
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Ventyx launches Network Manager™ DMS v5.3 with model-based volt/VAR optimization

New release enhances industry-leading platform for smart grid distribution operation. Customer tests show volt/VAR optimization can reduce peak demand by 0.8-2.4 percent.

Ventyx, an ABB company, has announced the availability of model-based volt/VAR optimization (VVO) as a commercially available application in the newest release of Ventyx Network Manager™ DMS (distribution management system). The new functionality will enable users to improve the efficiency and reliability of distribution systems, while reducing demand and environmental impact.

Oklahoma Gas & Electric (OG&E) is in the process of implementing the new VVO application as a key initiative in their smart grid plan. The objective is to reduce peak demand by approximately 75 MW within the next eight years by adopting volt/VAR on 400 circuits. In 2010, OG&E tested VVO on four circuits and observed that the peak demand reduction was between 0.8-2.4 percent.

Network Manager DMS is a world-leading application for distribution management, providing monitoring and control, network analysis and outage management in a single, integrated utility software platform. Release 5.3 of the application provides a platform for power distributors’ smart grid operations. Model-based volt/VAR optimization combines advanced sensing, capacitor and voltage regulator controllers, two-way communications, geographic information system (GIS) modeling and mathematical optimization capabilities to improve efficiency and reliability.

“Network Manager DMS 5.3 delivers true, model-based VVO,” said Oscar Tillberg, Vice President and General Manager of Ventyx Distribution Operations Solutions. “It is the new way of controlling voltage and reactive power on distribution systems, and it is a significant technological advancement compared to local and script-based centralized controls.”

There is a strong business case for investing in VVO. As the distribution network changes, the model is adapted to ensure that optimal conditions prevail. The resulting reductions in peak demand bring considerable savings, with no impact on the end customer.”

Model-based VVO utilizes a dynamic operating model of the distribution system, along with a mathematical optimization algorithm, to optimize the performance of the distribution system with a given operating objective. The basis of the dynamic operating model of the distribution system is typically the distribution connectivity model as found in a distribution organization’s GIS. The model is adjusted in the utility’s control room, either by operators or via an interface to the network’s SCADA (Supervisory Control and Data Acquisition) system, which transmits changes in the status of system components.

Ventyx has long been the global leader in supplying real-time systems that electric organizations use to manage and optimize power system operations. In the future, Network Manager’s DMS platform with the VVO application will assist with the integration of renewable generation, such as photovoltaic, on distribution systems. For more information about model-based VVO, please visit this link.

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ABB has won an order from the Majan Electricity Company (SAOC) in Oman to deliver a distribution management system and communications technologies for substations serving the city of Sohar, an important industrial hub, 200 km north of the country’s capital, Muscat.

ABB’s deliveries for the project, which is part of a large-scale development scheme in Oman, include an extension to the city’s existing Network Manager™ SCADA DMS (supervisory data acquisition and data acquisition, distribution management system) that monitors and controls the local electricity network.

Strategically placed on Oman’s coast, overlooking the Gulf of Oman, Sohar is enjoying a resurgence in importance as the country seeks to diversify its oil-based economy. In 2004, a multibillion dollar investment was made in the city’s port facilities to enhance opportunities for international trade and to encourage the development of local industries, such as aggregates and dry bulk commodities, which supply the construction industries in neighboring countries. Improvements to the port are ongoing and investments are also being made in smaller ports nearby.

Work on the distribution system in Sohar is expected to be completed by June 2012, a relatively short time frame for a project of its size. An ABB utility communications system will be installed alongside the SCADA DMS, incorporating multiple technologies. These include fiber optics, UHF radio and GPRS (General Packet Radio Service). The use of these different communications technologies will ensure full compatibility with Oman’s existing transmission system, owned and operated by the Oman Electricity Transmission Company.

This project is currently in the start-up phase. Functional design specifications are being finalized by experts from ABB and the customer’s organization to ensure that the performance requirements and technical specifications are met with the most cost-effective solution available.

This order is part of the third phase of the Sohar development plan. In phases I and II, ABB delivered SCADA systems, plant interfaces, RTUs (remote terminal units) and communications equipment for 29 of the Majan Electricity Company’s substations. Upon completion of phase III, an additional 14 substations will be added to the system, bringing a total of 43 substations under the control of their Distribution Control Center in Sohar.

“We are very pleased to be delivering our technologies for the third phase of development in Sohar,” said Jens Birgersson, head of ABB’s Network Management business unit. “A reliable supply of high-quality power will support long-term economic growth in this developing region.”

ABB serves utility customers in a range of applications, from power generation, power transmission and distribution to water and oil and gas. Expertise built up over more than a century has enabled us to develop optimized systems, products, and services for the management, automation, control, and protection of power networks.

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ABB software solution deployed to enhance electricity market in Ontario

Network Manager™ Market Management System to bring operational improvements, cost efficiencies and enhanced reliability to power transmission system

ABB has successfully deployed its Network Manager™ Market Management System (MMS) software to administer the Enhanced Day Ahead Commitment (EDAC) system at the Independent Electricity System Operator (IESO) in Ontario, Canada. The new system, part of the Ventyx software portfolio, is an extension to an earlier version of the MMS solution for market and energy management, deployed by ABB more than 10 years ago. It includes multi-interval optimization, an enhanced real-time market system and a day-ahead commitment feature.

Network Manager™ MMS is a complete management system for modern electricity markets. It provides the necessary flexibility, in terms of both function and scale, to adapt to changing electricity market requirements without extensive rework or costly system downtime. The various configurations of hardware and operating systems used ensure the lowest possible cost of ownership for end users.

“IESO has relied on the Network Manager™ solution for a decade,” said Bill Limbrick, IESO CIO. “MMS-based EDAC enables market participants to plan better and operate more effectively, bringing substantial savings for operators and consumers. We are very pleased with the quality and timeliness of the system which enabled a smooth transition to production operation.”

“This solution will help improve scheduling and optimize resource commitment,” said Jens Birgersson, head of the Network Management business, a part of ABB’s Power Systems division. “It is a great example of a well-thought-out market system that improves efficiency and makes the best use of available resources.”

As a system integrator and solution provider for electricity markets, Ventyx has completed 9 MMS installations since 1998, and a tenth will go live in 2013. The systems manage markets in the United States, Canada, Europe, China and other parts of the world. The new system for IESO was developed at Ventyx’s center of excellence in Santa Clara, California. The MMS product is part of the company’s Network Manager suite.

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Network Manager MMS has been installed to administer the Enhanced Day Ahead Commitment systems for the Independent Electricity System Operator (IESO) in Ontario Canada
In December, 2011, Ventyx, announced the availability of EV Transmission, a new analytical tool that provides mission-critical data to help traders and analysts more quickly analyze and understand the role that transmission plays in North American power markets. Offered as an online subscription service, EV Transmission brings transmission flow and outage data to the Ventyx Velocity Suite of market intelligence solutions. It has already attracted significant interest, and several clients including the American Transmission Company (ATC), Science Applications International Corporation (SAIC) and a major regulatory agency have already subscribed.

“This offering closes a significant “blind spot” for traders, transmission developers, regulators, utilities and generators seeking to understand how transmission congestion affects wholesale power transactions,” said Will Dailey, Vice President Energy Portfolio Management, Ventyx. “These firms previously would have had to compile these data manually in an ad hoc fashion. With EV Transmission, they have access to a rich data archive, heavily proofed and uniformly presented in an easily understandable graphical interface—along with powerful analytical tools—to help them make critical decisions more quickly and more accurately.”

EV Transmission is a new module in the comprehensive Velocity Suite energy market data service offering from Ventyx. It provides transmission market data from across the United States to traders, planners and analysts for analyzing how transmission flow and outage data may impact market prices. EV Transmission is the first product of its kind to enable the centralization and visualization of huge amounts of data in an easy-to-view series of graphical interfaces and maps. For example, EV Transmission can show time-series data on a map to indicate how transmission flows react to an event such as a hurricane or a power plant outage and how that in turn has impacted prices (see image below).

EV Transmission is the only offering of transmission data of this scale in the market,” said Dailey. “Combined with our powerful querying and data visualization tools and mapping capability, no other vendor can provide such a powerful experience to analysts.”

The value of the EV Transmission experience is also easy to understand, so much so that customers are already signing on. For example, American Transmission Company, a leading transmission company in the Midwest, will use the tool to support business development and communication with its stakeholders. In addition, the Energy, Environment, and Infrastructure business unit of SAIC and one of the major regulatory agencies have also subscribed to the module. EV Transmission complements other Velocity Suite modules covering the power industry. They are the sector’s leading source for data and research on market price and load, utility rates and financials, new power plant development and wholesale power transactions.

For more information about EV Transmission, contact your Ventyx sales representative or email: sales@abb.ventyx.com.
A

BB’s Neptuno system, which uses SCADA (supervisory control and data acquisition) technology, cloud computing and M2M (machine to machine) solutions, is helping to minimize water consumption and improve productivity on Spanish farms.

Automation can dramatically improve the effectiveness of crop irrigation systems, but these systems can be difficult to install in remote locations. Control elements are usually out of doors, exposed to extreme weather conditions, and mains electricity is often unavailable. In addition, farmers may lack the financial and technical resources needed to maintain sophisticated equipment distributed over wide areas of farmland. ABB’s Neptuno system uses SCADA technology coupled with M2M communications (largely based on GPRS communications) to provide a scalable, cost-effective irrigation automation solution for resource-constrained farmers.

The Neptuno solution manages irrigation information and control signals in the absence of mains electricity as the system’s RTUs (remote terminal units) run on long-life or rechargeable batteries, which can be fed by solar panels. The use of mobile rather than fixed communications to transmit all the necessary data such as irrigation status, humidity, alarms, etc, allows farmers to locate RTUs wherever they are needed, and to move them around as conditions change. It also allows the RTUs to be controlled and configured remotely, which means the farmer can make fewer trips to the fields.

To ensure minimal energy consumption, the RTUs can be configured for activation only when a preselected event occurs, or if an alarm is triggered. The farmer can enter a set of defined watering periods, which can be overridden if, for example, soil humidity falls below a certain point. To prevent external interference with the irrigation control system, Neptuno uses a private APN (Access Point Network), which enables users to assign a fixed IP address to each RTU in the network. In addition to securing information, this also minimizes the volume of communications traffic and transmission time in the system.

Depending on the farmer’s requirements, Neptuno can enable users to monitor, control and configure their irrigation systems via the Internet (using either a mobile phone or a personal computer). In larger schemes, farming cooperatives, for example, the basic system can be further enhanced to provide a centralized smart irrigation system (CSIS), which enables access to Neptuno’s SCADA interface through standard Web technologies, using the SaaS (software as a service) or on-demand software concept. Here, ABB provides all the core elements of the system, including software, servers, communications, power systems, etc. on the Internet (“in the cloud”), taking care of system upgrades and maintenance, so that farmers can focus on their core business activities.

By accessing equipment in the ‘cloud,’ the CSIS provides a level of performance that would otherwise require on-site servers, communications, aux-
iliary equipment and IT specialists. It enables irrigation systems to be run more cost-effectively and also achieve significant energy savings. A typical CSIS set up uses approximately half the energy required by a traditional SCADA system with an equivalent number of RTUs.

A number of Neptuno systems have now been installed in Spain, where projects vary in size from a few dozen to thousands of RTUs. Initial reports show savings of between 15 and 40 percent in water consumption; 10 to 25 percent in electricity consumption; and a 20 percent improvement in crop productivity, thanks to more effective irrigation regimes. Moving irrigation activities to avoid high-tariff electricity periods has further reduced energy costs.

The community of Canal del Zújar, 250 km south west of Madrid, hosts 11,122 plots across a vast 210 square-kilometer belt of prime agricultural land. Since the introduction of ABB’s Neptuno system, the annual electricity bill has been reduced by almost 12 percent, and water consumption by 20 percent. At the same time, maintenance personnel have reduced their annual driving distance by a total of 20,000 km. These savings are expected to increase as more farmers join the scheme.

Similar improvements have been made by the community of Lorca, in southern Spain. Here, farmers across a 125 km² area, have saved more than $900,000 just by reducing the amount of water used. Alongside the cost reductions, farmers also value their improved ability to control their irrigation systems from anywhere and at any time. Being able to respond instantly to changing field conditions improves productivity, and less time spent driving form site to site means lower fuel consumption and less wear and tear on vehicles. As a rough estimate, maintenance crews can avoid around 100 km of driving each year for every square kilometer of land under irrigation.

ABB’s irrigation control systems have helped Spanish farmers to reduce production costs and minimize water consumption without needing to employ expert operators or invest in sophisticated computer systems. Using the SaaS approach puts optimization solutions in the hands of more irrigators, bringing sustainable operational improvements through the conservation of water and energy.

This is a summary of an article published in the ABB Review. To read the full article and other articles published in the ABB Review, please visit www.abb.com/Review.

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ABB deliveries for Bangalore’s distribution system upgrade

Substation automation products to improve reliability, performance and safety in metropolitan Bangalore

In December 2010 Bangalore Electricity Supply Company Ltd. (BESCOM) placed an order for 700 remote terminal units (RTUs) to be installed in existing and new ring main units (RMUs) to upgrade the city’s 11 kV distribution network.

The first delivery for the BESCOM project, comprising 200 of ABB’s state-of-the-art RTUs arrived in December 2011. Thanks to their high flexibility and compact design, the same RTUs can be installed in BESCOM’s existing RMUs, as well as their new installations, where they will ensure reliable and accurate data acquisition and transmission of control commands.

ABB’s scope of supply for the Bangalore distribution system includes the design, engineering, manufacturing, testing, delivery, installation and commissioning of the 700 RTU560 units that will be needed, all within a construction period of 24 months.

Bangalore Electricity Supply Company Ltd. (BESCOM) is responsible for the distribution of electricity in three operating zones, including the Bangalore Metropolitan Area Zone (BMAZ). The BMAZ distribution network includes more than 800 11 kV feeders across an area of 1,600 km², serving almost 3 million customers. The objective of the upgrade project is to improve the reliability, efficiency and safety of the BMAZ distribution network.

The RTU560 units will serve as remote interfaces, enabling the distribution automation system to acquire data and send control commands to the RMUs, new line reclosers (LRCs), and new load break switches using a new communications system, which includes a digital microwave backbone system augmented by multiple address radio system cells to provide the “last-mile” RTU communication links.

Each RTU560 can be set for local or remote (distribution automation system) control. The “remote” setting enables the RTU to send and receive commands, while the “local” setting blocks external commands to ensure the safety of operators and maintenance staff working on the network.

The RTU560’s front panel incorporates a mimic diagram of the unit’s configuration. This includes information on the RMU load break switch and circuit breaker status. The panel also enables manual control (eg, via a push-button) of each set of RMU load-break switches and circuit breakers.

Reliable electricity supply is critical for Bangalore’s economy. ABB has installed more than 50,000 RTUs for more than 2,000 customers in more than 100 countries, and is world leader in medium and large RTU applications. BESCOM has chosen a partner they know they can trust.

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Mincom research: challenges and opportunities in the global mining industry

Study presents current viewpoints from executives at more than 200 mining companies across North America, Latin America and Asia Pacific

In November, Mincom released findings from its second-annual study into the views of key stakeholders in the mining industry. The Mincom Mining Executive Insights survey, 2011, has revealed the top concern this year among senior mining executives is optimizing production effectiveness, pushing last year’s primary challenge – ensuring workplace safety – into second position.

The 2011 Mincom study surveyed high-level executives at 256 mining companies in North America, Latin America and the Asia Pacific region to investigate their most pressing concerns, and where they see opportunities for growth.

When asked to rank their top challenges by level of urgency, respondents replied as follows:

- Optimizing/maximizing production effectiveness (73 percent)
- Ensuring workforce safety (53 percent)
- Recruiting and retaining a skilled workforce (47 percent)
- Managing capital projects (33 percent)
- Ensuring different departments work together (33 percent)
- Ensuring equipment operates reliably and predictably (32 percent)

"Overall, the attitude of this year’s respondents is positive, with 69 percent expressing optimism about their general business outlook," said Jennifer Tejada, executive vice president and chief strategy officer, Mincom. "Not surprisingly, given the growing global demand for mining products and high commodity prices, maximizing production is by far the number-one priority for global mining executives. We see this trend among many of Mincom’s mining customers as they work to achieve productivity improvements, reduce the impact of production bottlenecks, and improve integration of processes across the mining value chain."

When asked to rank their top three obstacles to achieving organic growth, this year’s respondents identified the following:

- Complying with government regulations (40 percent)
- Delays in getting new mines operational (32 percent)
- Difficulty in standardizing business processes (22 percent)
- Inability to move quickly enough to exploit commodity prices (21 percent)
- Inability to meet planned production goals (21 percent)

"Mining companies face additional regulatory scrutiny as they look to develop new sites and increase production at existing ones, leading this year’s respondents to once again identify regulatory compliance as their primary obstacle to organic growth," said Tejada. "We also noted the number of executives who identified difficulty in standardizing business processes as their primary growth obstacle has nearly doubled from last year. This spike may indicate a paradigm shift taking place within the industry, in which more companies view the ability to operate predictably across all enterprise operations as a principal driver of value."

The study also revealed that lessons learned from the economic downturn still predominate, with 65 percent of respondents adopting aggressive cost-control strategies to maintain or improve profitability. Another 43 percent are adopting best-practice work and asset management frameworks for critical production assets, indicating a continued focus on streamlining internal processes to achieve cost savings and efficiencies.

"Based on this year’s research, we find the overall outlook for the mining industry is conservative, but increasingly positive," said Tejada. "One of the recurring themes we also uncovered is the fundamental importance of cost control, predictable performance and growth achieved by the standardization of processes and the adoption of best practices."

For complete survey results and additional analysis visit this link.

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Collaboration and commitment brings value to customers

ABB is strengthening its North American operations to focus on customer needs and ensure that customers receive the best possible products, systems and services for substation automation.

Enhancing or upgrading existing protection and control schemes with state-of-the-art substation automation solutions is an important aspect of system optimization for the reliable and efficient delivery of electricity. ABB provides sustainable migration strategies for step-wise retrofits as well as whole system upgrade projects. Whether system design and engineering, protection and control panels, drop-in control houses, project management, procurement, installation or testing and commissioning, we are helping our customers improve their operations and maximize their return on investment.

ABB's North America substation automation team, specializing in automation, protection and control, is growing, not only in size, but also in market influence. With a highly experienced engineering team, our technical expertise is considerable. Couple this with the depth and breadth of ABB’s product portfolio and our ongoing commitment to collaboration with EPCs and other industry players, our ability to deliver next generation substation automation solutions to the market is second to none. Following are but a few examples of how we are bringing improved operations and scalable solutions to our customers.

Large western US utility looks to ABB for innovative, multi-vendor solutions

Among the several projects completed and currently underway for this utility, ABB is delivering a SCADA installation and upgrade project, providing the specification and design of multiple drop-in control houses and the design and integration of the utility’s first GIS (gas-insulated switchgear) substation. The successful execution of these projects has earned ABB the right to bid on
additional SCADA upgrade projects at up to 200 sites.

**Step-wise implementation strategy and retrofit experience takes ABB to the Northeast**

When a large northeastern US utility wanted to upgrade RTUs (remote terminal units) in all of its 37 transmission substations and two generating stations, within a time span of two years, they entrusted the project to ABB. Because minimal downtime is crucial to every project undertaken by this utility, the customer wanted to reuse existing wiring and communication systems when upgrading their substation automation systems. Not only did ABB meet the technical requirements and limited space dimensions, but ABB’s step-wise implementation strategy and retrofit experience enabled the utility to keep the existing communications systems in operation. The turnkey retrofit involved the implementation of redundant and scalable RTU solutions with GPS antennareceiver for the concentration of time-stamped I/O data and protocol conversion, as well as state-of-the-art substation automation systems for local control and monitoring based on ABB’s MicroSCADA Pro product. Within the full scope of supply, ABB handled the entire engineering, built and tested the panels, and commissioned every project on site.

**Successful execution leads to project and sole-sourcing of ABB RTUs**

It all started with an RTU prototype engineered by ABB in response to a request from a large utility company in Latin America. Rigorous acceptance tests were conducted by the customer and ABB’s prototype met or exceeded all technical requirements. As a result, ABB was awarded not only an immediate RTU upgrade project, but the ABB RTU solution was so technically advanced and responsive to the utility’s needs that ABB’s RTU560 is now the standard for the country’s entire power system network.

**ABB’s advanced engineering enables EPCs to provide customers best-in-class solutions**

Working with EPCs to understand the unique challenges and priorities of their end user customers has enabled ABB to provide greater efficiencies and reliability to industrial clients.

In a recent industrial substation automation application, ABB was invited to bid for a pre-specified conventional hardware solution. ABB submitted a proposal in line with the request, but also proposed an advanced, future-proof solution based on IEC 61850. Compared to the original scheme, this solution offered improved redundancy and reliability at lower cost. These advantages came from the use of fiber optics in place of conventional copper cables, and Ethernet instead of serial communication. The EPC chose to proceed with the advanced solution.

This case illustrates the market acceptance of ABB’s advanced technologies for power system management. The same EPC has since awarded subsequent contracts to ABB for power management systems at three locations. Technologies for the new projects include ABB’s MicroSCADA Pro SYS 600C and the RTU560, mentioned above. ABB will also deliver the latest Relion 600 series transformer, feeder and busbar protection platform for low- and medium-voltage, as well as protection, control, metering and monitoring for high-voltage switchgear for .

**Mission critical reliability and communication requirements drive selection**

A rural cooperative’s new substation automation project required DNP over TCP/IP communications via a fiber network, without the use of converters. The co-op delivers electricity to a significant US military base so reliability is an essential requirement. ABB’s solution included an advanced protection and control IED from the Relion family, the RET670. This enabled the customer to not only improve reliability and communications in their substation, but to also reduce the number of devices needed, from four traditional relays to a single IED. Again, reducing the hardware components of the system brought cost savings and improvements in reliability.

Utilities and industries across the world are faced with increasing pressure to deliver reliable, high-quality power supplies at affordable rates and with minimum environmental impact. The need to optimize energy flow in the power system and make best use of existing resources is extreme. ABB is committed to delivering reliable, flexible solutions using the most effective technologies to ensure that our customers achieve maximum efficiency, availability and reliability.

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