Newsletter of the Business Unit Network Management

Network Management Newsletter
Issue 2/2010

Dear Readers,
You may have heard that ABB recently acquired Ventyx, a global energy management software provider to energy, utility, communications and other asset-intensive businesses.

The acquisition of Ventyx enables us to strengthen and expand our Network Management business and more broadly, our Smart Grid solutions to better serve the needs of our customers with an extended portfolio of network management solutions. In fact, we will soon be able to triple the number of energy management software solutions in our offering. Our plan is to merge Ventyx and ABB's Network Management businesses into a single energy-management software business unit.

One major advantage of this merger for customers is that ABB and Ventyx's solutions are nearly 100 percent complementary to each other. ABB will combine its Operational Technology (OT) offerings – including DMS, OMS and SCADA – with Ventyx's broad Information Technology (IT) solutions, which include trading, asset management and energy forecasting. This OT/IT combination will allow us to pool our resources and share the expertise of our engineers and IT staff.

Industry analysts have noted that this merger puts ABB squarely at the heart of Smart Grid activity, not only in operations but also in the growing enterprise utility smart grid software market. These analysts also note that customers considering new Smart Grid initiatives will now access to single, credible network provider with broad offerings across both OT and IT.

You will be hearing more about what this new partnership could mean for you in upcoming issues of the Network Management Newsletter, so stay tuned. The future is bright. In the meantime, if you have questions or feedback related to Ventyx, please don't hesitate to contact me or your local ABB representatives.

This exciting new partnership is just one example of how we are working to strengthen our capabilities and serve our customers better. Look through our newsletter for other examples of how ABB's Network Management solutions are making a difference today.

Best regards,

Jens Birgersson
Network Management Business Unit Manager

Power and productivity
for a better world™

System group Utility Communications in the spotlight at EXPO 2010 Shanghai

Hosted by Peter Bill, Head of System Group Utility Communications, more than 30 EPC customers from the region gathered in the Swiss Pavilion at the EXPO 2010 Shanghai, China to learn more about ABB's Utility Communications' solution suite and our endeavor to drive the deployment of Smart Grids in context of "Better City, Better Life".

Peter Bill, Head of SG Utility Communications welcoming customers in Swiss Pavilion

The theme of Expo 2010 is "Better City, Better Life," representing a common concern of the international community for future policy making, urban strategies and sustainable development. In 1800, 2% of the global population lived in cities. In 1950, the figure raised to 29%, in 2000, almost half the world population moved into cities, and by 2010, as estimated by the United Nations, the urban population will account for 55% of the total human population.

This urbanization drives an increasing demand for energy in Cities, and electricity in particular, but at the same time society needs to reduce carbon dioxide emissions. As a consequence, we need an electric system that can handle these challenges in a sustainable, reliable, secure and economic way – these future power systems are referred to as the "Intelligent Grids" or "Smart Grids".

In the presentation at the Swiss Pavilion with participants from Engineering, Procurement and Construction (EPC) companies, ABB provided an overview of its current Utility Communications' solution suites which includes technologies that are essential for such future electrical systems. Attendees also learned that in Smart Grids - and more in particular Distribution Communication networks - integrated, hybrid and multi-tier communication architectures are key enablers for future applications. In designing and supplying any of these future-oriented communication networks it is critical to have a profound knowledge of today's and future needs of the grid applications. Together with Utility Communications' global presence and close cooperation throughout the system's life-time, ABB is in the excellent position to provide solutions for the stepwise introduction of Smart Grids. The attendees were also impressed by the Utility Communications' capabilities to provide "One-Stop-Sourcing" in order to reduce project complexity and cost while ensuring a seamless project implementation, which is key in any EPC business.

Gustavo Chacon (CHPAU/PSNV) and Philip-Jun Zeng (CNABB/PSN) presenting System Group Utility Communications

Needless to say, that the ABB group with its broad portfolio of power technologies has and is continuing to pioneer many of the future needed applications and technologies. This makes ABB the natural partner for any Smart Grid deployments.

The sessions at the Swiss Pavilion closed with a reception where participants could taste and enjoy some of the Swiss culinary specialties.

EPC customers in front of Swiss Pavilion with Romeo Comino (CHPAU/PSN)

Copperbelt Energy Corporation PLC (CEC), Zambia extends SCADA communication network with ABB Ethernet Solution

CEC is an electrical utility in the Copperbelt Province of Zambia running power transmission lines, supplying power to the mines and offering telecommunication to service providers. CEC runs more than 880 km HV lines and owns around 550 km of optical ground wire (OPGW). For operation of its power network, CEC runs an ABB BECOS32 SCADA system in combination with ABB RTU560s.

In order to upgrade the existing SCADA system with IEC60870-5-104 SCADA communication protocol, CEC will implement an Ethernet network based on ABB's switch solution AFS650 and 670 as well as ABB's VHF radio AR160 and 24 enhanced ABB RTU560s with IEC 60870-5-104 support.

The main network consists of six rings with a total of 36 utility hardened switches. The network design focused especially on optimized maintenance of the communication network with the following highlights:

- Configuration watch-dog implementation: In communication networks a misconfiguration can lead to disconnection of network parts. In such cases troubleshooting can cause high efforts and costs. The watch-dog feature allows avoiding any unintended disconnection by an automatic configuration role-back in such case.
- Deployment of Configuration Recovery Adapter (CRA): The CRA is an external memory for configuration and firmware, which allows easy and fast exchange of communication hardware, also from untrained maintenance personal.
- Redundancy: High availability by implementation of ring topology and usage of 19" and DIN rail switches with redundant power supply.
- Integration of third party Ethernet equipment into the network design.
- Usage of AR160 radio solution: The AR160 radio solution provides an integrated Ethernet interface and offers advanced configuration possibilities.

ABB will supply this CEC project with a highly reliable communication network that will enable CEC to also run future required applications on their network.

COPPERBELT energy

System group Utility Communications launches customer web portal

As a leading provider of communication solutions for critical infrastructures, a close cooperation between customers, partners, and ABB is fundamental to delivering solutions that enable the industry to meet its critical business objectives today and in the future.

As part of the endeavor to further build on interactions with customers and partners, ABB decided to launch a Utility Communications Portal.

The Portal is a platform that allows registered peers to be among the first to receive the latest on ABB's Utility Communications business, events and exhibitions, latest references and business cases, white papers and much more.

In order to register please visit the website:

www.abb.com/utilitycommunications

Your Login: 5400 0415 8589 3735

We hope you will find the new Portal of interest and we look forward to communicating with you via this new Utility Communications Portal.

Peter Bill, Head of System Group Utility Communications

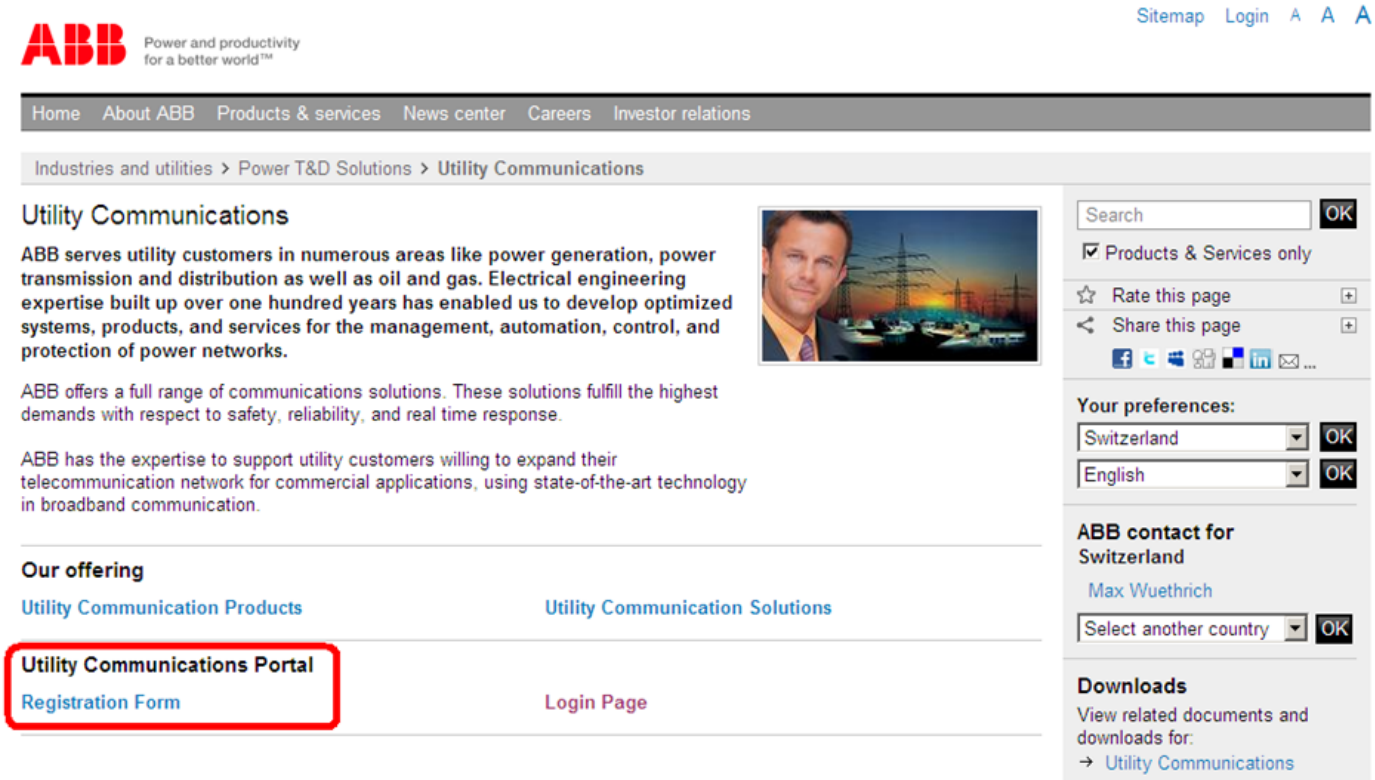
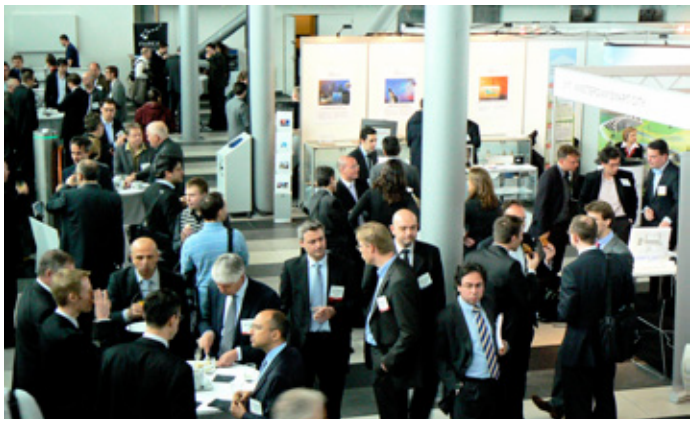


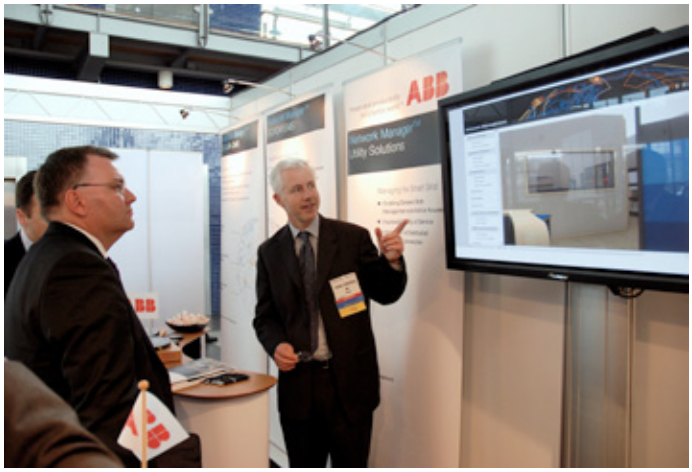
ABB Network Management at Transmission & Distribution Europe in Amsterdam

The yearly Transmission & Distribution conference, hosted in parallel with Smart Grids Europe, drew a record number of delegates. Close to 800 visitors and some 40 vendors registered for this event that was held in Amsterdam this year. The main interest was to come and listen to the advances in the smart grid area with the Smart Amsterdam project as the main attraction.

ABB was well represented with a booth in the exhibition hall, co-hosted by the Network Manager and Distribution Automation branches within the ABB Power System segment. Side by side the visitors could see the new Network Manager system presentation and the Relion family of distribution automation products. The Network Manager system presentation featured prerecorded demonstrations of some commonly used functions of Network Manager. First time visitors as well as exciting customers appreciated the presentation of the display graphics of the release 4.1 version of Network Manager as well as the new features of the system. Moving from the control room to the substation was only one step and then one could try out the new Relion family of feeder protection equipments. The booth featured two units and the visitors could get hands on experience with the relay protection devices as well as query all about the ABB experience with IEC 61 850 compliance.



The IEC 61850 compliance and field experience was also the subject of a presentation by Mr Olgan Durieux from ORES in Belgium. Mr Durieux was presenting their positive experience of using a combination of the IEC 104 (formally known as IEC 60870-5-104) for control center to substation communication and the IEC 61850 for inter-substation communication. ORES has used a mix of ABB and other vendor's relay protection devices so sharing their real life experience in this field was much appreciated by the audience.



The importance of managing historical data stored in the SCADA system was well presented by Mr Sindre Naess of Statnett SF, Norway. Statnett is using a Network Manager system and has developed strategies for managing the historical data from UDW (Utility Data Ware house). One of their challenges was to make the historical data available also for further analysis outside of the "inner circle", meaning the restricted computer area of the operations department. Bringing the data outside this area and making it available over their office network is something many utilities today are working with. Statnett presented their way and received a lot of interest in their solution.

From Italy, Mrs Lilia Consiglio of ENEL, presented an insight of the mega project of SCADA - AMI integration. ENEL has been an early adopter of modern meters with communication and has today some 30 million communicating meters installed. The goal of the project is to integrate metering data and SCADA control in order to better manage both planned as well as unplanned outages in the future. Needless to say, ENEL manages one of the largest distribution networks in Europe. The project is in a mid-phase now and we look forward to hopefully hearing more about this project in the next year's event.

Next year's Transmission & Distribution Europe / Smart Grids Europe conference and exhibition will take place in Copenhagen, Denmark on 12-14 of April, 2011. ABB is looking forward to seeing you there.

ABB Network Management at Powertage 2010

ABB Network Management was a leading contributor at the Powertage Conference and Fair in Zürich (Switzerland), June 1st – 3rd, 2010. Powertage is the leading Conference and Fair in Switzerland for the Power industry and has become the industry's meeting point. This year, ABB was one of the 147 exhibitors.

ABB Network Management presented its solution for Network Control, Communication and RTU. Network Manager's latest developments were shown using a copy of a customer's system, giving the numerous visitors at the ABB stand a very good overview of Network Manager's capabilities. The new ABB FOX Switch (AFS675), the 19" Ruggedized Switch of the AFS Family, was presented for the first time at a fair.

Fruitful discussions and the positive feedback from the visitors made the ABB attendance a great success.

"This type of smaller exhibitions is also important for us since we get a chance to focus and speak with the customers in more depth. We are also closer to their locations so they come to this event with more representatives than to the larger international exhibitions", concludes Dr. Johannes Hoffmann, the Network Manager responsible person at the Powertage conference.

NUGM - Nordic User Group Meeting Stockholm 25-27th May 2010

The Network Manager users from four Nordic countries recently gathered for the highlight of the year – the user group meeting. This year it was hosted by the Swedish organization and held in Stockholm in an old Latin school building.

Around 80 people from Sweden, Norway, Denmark and Finland gathered for a three day meeting to learn about the product as well as the changing environment around us. The latter was very well presented in the introduction presentation by the Business Unit manager, Mr. Jens Birgersson, when he presented the ABB acquisition of Ventyx Inc. of USA. In this +1 Billion USD acquisition, ABB will substantially grow its business in software and become the first to offer complete solutions based on integration of OT, operational technologies (SCADA etc), and IT, information technologies (portfolio management etc) for the utility sector.

Another area of changes is the Smart Grids transformation of the traditional network to the newer and smarter networks (Smart Grid). This was exemplified by Mr. Tomas Wall, vice president of Fortum, a leading utility in Sweden and Finland.

Mr. Wall presented the driving forces behind this transition in a very innovative way and many of us listeners appreciated his explanation of why the Smart Grid will have a place in everyone's mind in the future. He also presented the Stockholm Royal Seaport project which is a major project executed in a newly designed but not yet constructed part of central Stockholm. The carbon footprint for this part of the city will be a record low and the first visible step towards the realization of the 2020 targets. Network Manager will play a central role in this project as the brain of the Smart Grid labs, the control center for handling of all electricity in this part of the city.

After the introduction the meeting moved into subjects such as SCADA maintenance, distribution applications, operator's forum, etc. The large group was split into smaller groups in order to encourage an interchange of ideas and networking between the users.

Outside of the conference rooms, a small exhibition with invited vendors was arranged to showcase the latest developments in computer monitors, operating systems, streaming video, control room design and more. The users could also test the new demo system or ask questions about features of the next release of Network Manager.

No user group meeting is complete without a bit of entertainment, so one of the evenings was spent digging "Golden Hits", a musical show with truly high energy. Surely many had the thought that all of this is only possible with a safe and reliable delivery of electricity – precisely what Network Manager is ensuring!

RTU560 for DIN rail – a new product line for low-end applications with full RTU560 functionality

All RTU560 functions are now available as a DIN rail solution. The new cost effective and compact product line is perfectly designed for distribution and low-end applications.

The open architecture of the RTU560 family supports different applications such as remote control, substation automation, communication gateway, distribution and feeder RTU as well as smart grid applications.

With an integrated Human Machine Interface and Cyber Security functions such as user account management and user activity logging, the new flexible RTU560 for DIN rail offers a great range of benefits.

The reduced installation effort and the possibility of remote diagnosis with data and configuration updates are only two of the several highlights of the new product line.

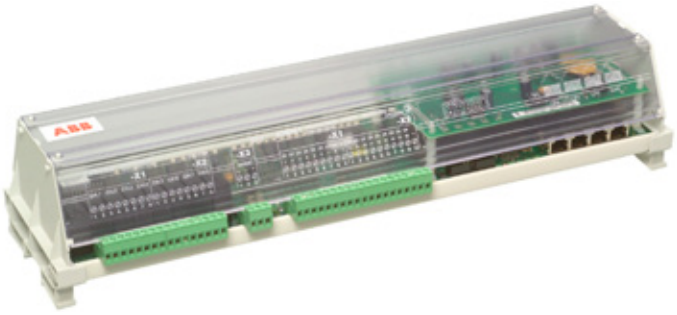
Functionalities such as IEC 61850 client and server functionality, fault current detection, PLC logic functionality, archives for events, measurements, counter values, disturbance records and load profiles top up the performance of the new RTU.

Currently the product line is available in three different versions:

- Fixed rugged metal housing
  - 560CMG10 as gateway
  - 560CIG10 with integrated multi-I/O-board
- Scalable housing
  - 560CMU01 with up to 4 integrated I/O modules

All versions can be extended with different I/O modules from the family.

The RTU560 for DIN rail has already proven its suitability in several worldwide references:



Asia

One of Thailand's main power authorities expanded its Distribution Management System (DMS) facilities to enhance the ability to supply electrical power throughout its service territory with reduced system restoration time and guaranteed voltage quality.

Its seven DMS systems communicate with its field devices within their dedicated region using DNP3.0 protocol. More than 400 RTU560 devices are installed due to their cost and space saving design for the feeder RTUs and bay level substation RTU application.

Europe

Facing a growing distributed generation of renewable energy, a German power utility was looking for a solution with a GPRS/GSM communication to improve the information and knowledge of the load flow situation in the medium voltage network. In the network parts with a high amount of decentralized power generation along the feeder, local intelligence and local information is needed to estimate the current network status. The RTU560 was extended with cost effective GPRS modems and installed in the medium voltage networks at the connection points of the decentralized generation. The data from these RTUs has been integrated into the customer's state estimation to have a full load flow data set available.

Research Project

The RTU560 DIN rail product line is already successfully used in various projects. Additionally ABB is participating in the MeRegio project, one of Europe's leading research projects in smart grid technology. In this project, ABB is setting up grid automation technologies in secondary substations based on a RTU560 DIN rail product that will be fully integrated in a real-time communication infrastructure between energy consumers, multiple distributed energy resources and smart storage devices. Gaining experience in realizing pilot projects is one element of ABB's strategy to develop and immediately test smart grid applications. Applications like simplified measurements of power flows and voltages on medium voltage level and integration of smart meter information have been the first successfully developed and field proven smart grid applications.

The North American user group meeting was a great success

ABB Network Management in North America hosted the Spring 2010 User Group Meeting April 25–28, 2010 in Las Vegas, Nevada. More than 180 attendees from 34 utilities and 16 partners from 9 countries attended this three day event.

The meeting consisted of general sessions plus breakout technical sessions for Network Manager as well as sessions conducted by customers and third-party vendors pertaining to hardware, smart grid, security, and applications.

The Sunday evening welcome reception offered colleagues the opportunity to renew past acquaintances, make new friends, and view various ABB and third-party vendor products on display in the demo room.

The conference meetings began on Monday morning with a general session that covered the agenda and guidelines for the three-day meeting. Herb Goforth, of NV Energy, was the guest speaker who presented a comprehensive overview of NV Energy's energy outlook. Afterwards, Salim Khan, senior vice president and general manager of ABB Network Management, North America, welcomed everyone to the general session and provided an operations update. The general session also included product roadmap as well as updates on the latest enhancements of the platform and major components.

Monday's General Session

Following the general session and the afternoon technical sessions (DMS, FeederAll, operators, markets, and applications), Monday evening's social event was a social hour in the Demo Room Showcase allowing attendees to converse and network with ABB employees, other customers, and vendors.

Technology sessions continued Tuesday with specific sessions identified for Operators, Markets and Applications, Security and Integrators, DMS, and FeederAll. Sessions were hosted by the session sub-chairperson and an assigned ABB representative, and covered topics such as user interface enhancements, customer experience in recent system upgrades, impact of wind farms and other renewables, use of visualization techniques, and implementation of advanced applications.

Tuesday evening's social event was another social hour in which attendees, employees, and vendors enjoyed conversation, beverages, and light hors d'oeuvres in the Demo Room Showcase.

Sessions on Wednesday included ABB's update on Smart Grid technology, a presentation from HP, a DMS session on enhancements and user experiences, and the FeederAll session on enhancements and fixes. In the afternoon, attendees enjoyed an amazing guided tour of the Hoover Dam, a technological and engineering marvel of the modern world. After the tour, UGM attendees remaining at the hotel joined ABB staff for a farewell dinner to round off another very successful ABB Network Management user group meeting.

Up Close View of the Hoover Dam

The User Group Committee members are already planning focus group meetings for the autumn of 2010, and another large event for Spring 2011 in Boston, MA.

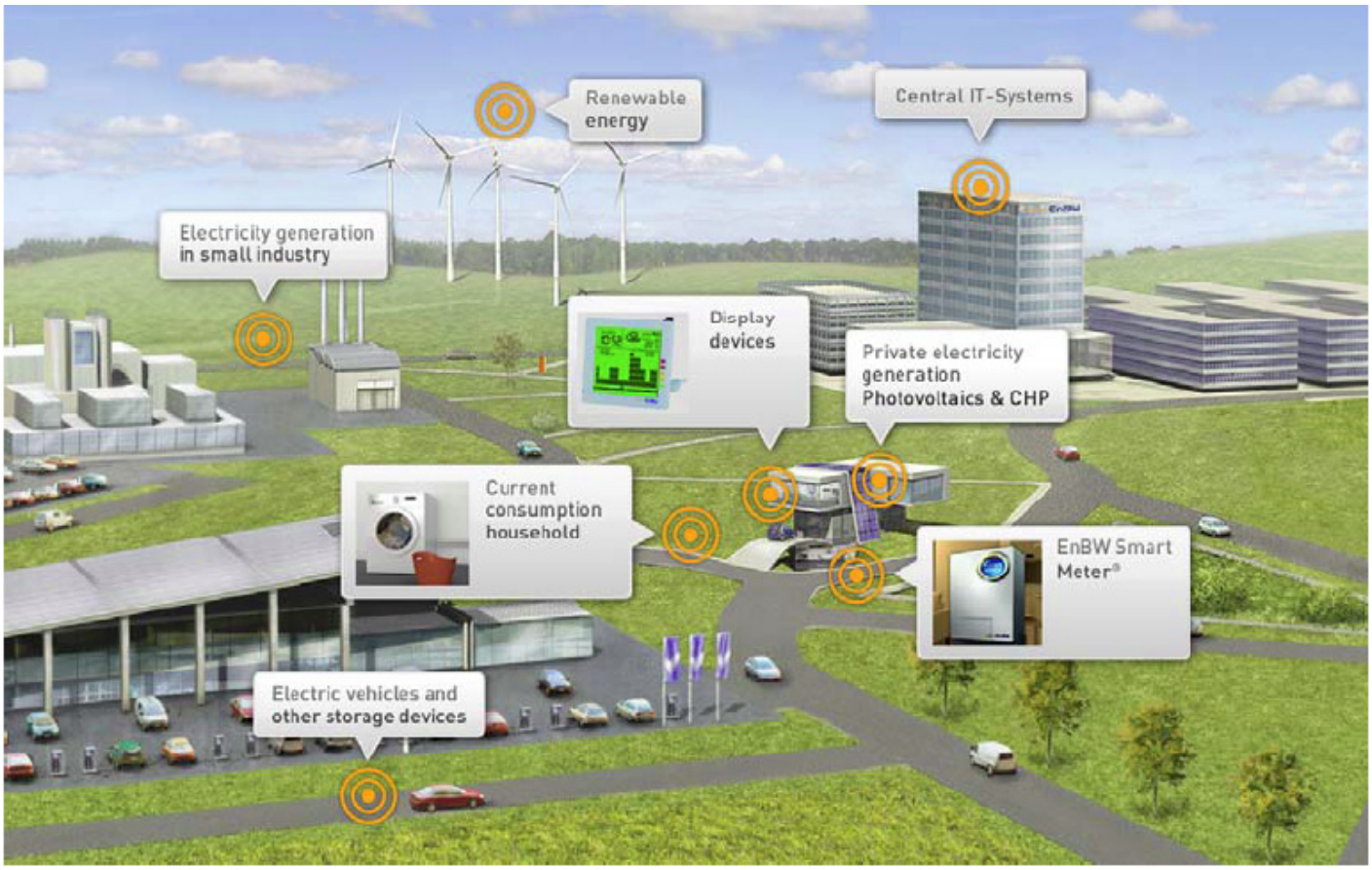
Project Summary
MEREGIO – Minimum Emission Region

In Germany many ideas and concepts have been proposed to achieve the goal of reducing CO2 emissions by 2020 by 20 percent compared to 1990 levels. "MEREGIO – Minimum Emission Region" is one such scheme and applies a holistic concept. The objective is to develop regions with power supply systems that are optimized with respect to their greenhouse gas emissions. This is based on three specific components, namely

- E-Energy marketplaces (for energy products, system services, and other services) for producers of electricity, end customers, and intermediaries for coordinating the supply and demand of energy and complementary services;
- a sophisticated and innovative energy infrastructure; and
- a powerful information and communication infrastructure that links the physical infrastructure to the
- marketplace and controls it according to the specific market situation at hand.

The project focuses on developing technical and economic concepts, which implement the three components and put them to work in a pilot region with about 1000 participants at the towns of Göppingen and Freiamt (Baden Württemberg / Germany). Furthermore, the project plans to develop a minimum emission certification for regions where concrete specifications and standards are developed based on the experience gathered in the field test. The objective is to motivate regions to actively reduce their greenhouse gas emissions and promote specific measures to cut CO2 production. Important part of the project is also the boost of awareness on energy efficiency topics in public and also specialized on different customer segments (households, middle sized industry and public sector).

The interdisciplinary project team combines the expertise of five chairs of the Karlsruhe Institute of Technology (KIT) with the industrial partners EnBW (having the project lead), ABB, IBM, SAP, and systemplan (an engineering consulting company on the field of energy efficiency measures in industry). While the industrial partners focus on the business context and an ICT based implementation to be applicable in the field trials, the KIT is mainly involved in the analysis, simulation, and development of concepts for each area.



The important work of standardization

We are all aware of how important standards are to facilitate interoperability and integration of systems from different vendors. Standards have become increasingly important at procurement of systems such as SCADA, EMS, DMS, planning tools etc. Standards are used when connecting RTUs to SCADA systems or as presented below, when exchanging model data between SCADA/EMS/DMS as well as planning systems.

Standards are taken for granted, but who are doing the standards and how is the everyday life of the people participating in the forming of these standards? In this article we'll shed some light on this through one of several ABB engineers that are active in this area. Lars-Ola Österlund is a senior member of the workgroups dealing with the CIM (Common Information Model) development and standardization. So we have asked Lars-Ola to write a letter for the Network Manager News readers and describe some of his recent works.

"I work as a system consultant for transmission (SCADA/EMS) applications of the Network Manager system in Sweden. In my work I have the responsibility of being the ABB representative in several standardization committees within IEC and I also devote much of my working time to hands on work with the CIM standard. The work is in large writing of specifications but also quite a bit of networking, i.e, meetings. Two such IEC meetings were recently held, the IEC TC57 plenary meeting in Kista Sweden and the IEC TC57/WG13 in Tokyo Japan. This letter summarizes the meetings and gives a short overview of IEC TC57 work in general.

IEC - International Electrotechnical Commission

IEC or International Electrotechnical Commission [1] is the organization for creation of international standards for the electro technical industry. The organization was funded in 1906 in London. The work is carried out in technical committees, TCs and TC57 is the committee for "Power systems management and associated information exchange". As well as communication, this covers power system control including SCADA, EMS, DMS, MMS, substation control, etc.

Work in TC57 is split in working groups (WGs). WG13 is the working group for "Energy management system application program interface (EMS - API)". It is responsible for maintenance and development of the CIM (Common Information Model), for the basic power system. The group was founded in 1996 to carry the CIM development work sponsored by EPRI into an international standard. Since then the CIM has gone through many changes due to usage experiences and extensions to support new functionality. Annual interoperability tests starting in 2000 has been important to discover and correct problems. Recent new functions supported are planning (power flow and short circuit calculations) and dynamic simulation.

Work in IEC is done in projects where each project results in a standard or technical specification, eg, 61970-301, which describes the basic CIM power system model and 61970-452, which is the data exchange profile for equipment models.

Report from the TC57 meeting

One of the more important agenda items was the one on the performance of the working groups. The technical responsible person in TC57 gave an overview of the progress in IEC projects. Late projects were requested to explain why they are late and explain any actions to improve delivery of results. If a WG does not deliver results for a longer period IEC may decide to close the group. This happened to WG14 at the IEC meeting in Seoul, Korea 2008. The new work program for WG14 was also reviewed as a result from the questioning of WG14 at the Seoul meeting.

Next, each WG convener gave an overview of the projects in their working groups. The groups reporting were:

- WG 03 Telecontrol protocols
- WG 10 Power system IED communication and associated data models
- WG 13 Energy management system application program interface (EMS-API)
- WG 14 System interfaces for distribution management (SIDM)
- WG 15 Data and communication security
- WG 16 Deregulated energy market communications
- WG 17 Communications systems for distributed energy resources (DER)
- WG 18 Hydroelectric power plants – Communication for monitoring and control
- WG 19 Interoperability within TC 57 in the long term (including report on Task Force Smart Grid)
- WG 20 Planning of (single-sideband) power line carrier systems

Liaisons from other groups reported:
- CIGRE: Category A
- SC D2-24 Information systems and telecommunications – EMS architectures for the 21st century: Draft MoU
- SC B5-38: Protection and automation
- UCAIug: Category D with WG 10, WG 13 and WG 14
- ebIX European forum for energy business information exchange: Category D with WG 16
- ENTSO-E: Request for category D with WG 13 and WG 16
- IEEE PES PSCC Security Subcommittee: Category D

It is interesting to note that CIM is no longer a standard used only in North America; it is also being used in real life for model exchange between European TSOs within ENTSO-E. This includes use for building of large European planning models as well as Day Ahead Congestion Forecast.

Other issues discussed were the maintenance of the CIM model. As mentioned above, the IEC create standards in the form of specifications. The specifications are sold as paper or electronic (PDF) documents derived from the CIM itself. The CIM is a UML (Universal Mark-up Language) model maintained in a UML editor (Enterprise Architect). As working groups (WG13, WG14 and WG16) extend the CIM with support for new functions, the UML becomes larger and more difficult to maintain as a single UML model. A proposal was made on how to modularize the model.

Other meetings held in Kista later in the week were on WG19 and CIGRE D2.24.

WG19 has the task to coordinate work within TC57. One coordination task is the harmonization between 61850 and CIM. It was discussed whether 61850 and CIM shall be unified or harmonized. The difference is that harmonization describes how the two models can be translated between each other, while unification is to actually make them the same. The impact of unification is large, as this will result in large changes in both 61850 and CIM. For practical reasons harmonization will be used.

Report from the WG13 meeting

WG13 has a large number of projects where all have industry relevance. Hence the work load on WG13 is high. In particular, the CMM (CIM Model Manager) that is the editor of the CIM UML, has a high work load. I have the pleasure of being elected the CMM for 2010. Besides the projects, WG13 has a large number of issues with the CIM model to work with.

Some important current issues are:
- Unification of the transmission and distribution network models.
- Power transformer model supporting both distribution and ENTSO-E needs (phase shift tap changers).
- DC models
- Support for multiple object names needed by WG14 for meter readings.

Currently, there are more than one-hundred open issues like the above.

WG13 is currently working with the following projects resulting in the IEC specifications:
- 61970-301 Base CIM model
- 61970-451 SCADA Data Exchange
- 61970-452 CIM Static Transmission Network Model

Profile Group
- 61970-453 CIM Based Graphics Exchange
- 61970-454 Business Object Registry Service Specification
- 61970-455 Model Population Interfaces
- 61970-456 Solved Power System State Interface
- 61970-552 CIM Model Exchange Format Status

Recently the 452, 456 and 552 specifications have been extensively updated to support incremental data exchange and ENTSO-E needs for Day Ahead Congestion Forecast as well as planning. These specifications are the basis for interoperability tests that will be held in June and July 2010. Including the action items from the previous WG13 meeting the issues and projects above kept WG13 busy for the entire Tokyo meeting.

CIM around the world

The Chinese and Japanese delegates in the WG13 meeting presented how CIM is used in their respective countries.

In China, CIM is used to exchange models between the regions. As the Chinese network is tightly connected and rapidly developing, models are exchanged every 15 minutes. To make the exchange efficient, a column-oriented format based on CIM has been created. The reason for invention of this format was to reduce file size and processing time. Both the size and processing time reduction were debated in WG13.

Japan is divided in nine regions with weak network connections between them. The northern Hokkadio Island is connected to the main land with a DC-link. The northern main land is running with 50 Hz and the southern with 60 Hz. As the network connections between the regions are weak each region has no strong need for detailed modeling of the neighbors; hence, CIM has not been extensively used. Quite the opposite of the situation in Japan, the USA and Europe use tightly coupled transmission networks and frequently need to send and receive model data from the neighboring network."

CIM standard is also considered for a similar extension into the distribution systems, but with the very large number of different system components used in distribution networks, the work will need some time before a recognized standard will be available.

Now we know a bit more about the laborious work of forming and maintaining standards. For additional information contact Mr. Lars-Ola Österlund at lars-ola.osterlund@se.abb.com.

References:
1. web site; www.iec.ch

The new Control Center for Moldelectrica - a project that makes a difference

About Moldova

The Republic of Moldova is a small country in Eastern Europe, close to the Black Sea. It covers a surface of only 34,000 sq km and has a population of around four million. It is bound to the north, east and south by Ukraine. In the west, Prut River separates Moldova from Romania. The land is covered by vivid views of sloping hills covered by forest. The woodlands alternate with orchards and vineyards, where ever in Moldova walnut trees along the roads can be seen.

Mild and pleasant temperate continental climate has made the country one of the most productive agricultural regions and major supplier of agricultural products. The capital and the largest city in the country is Chisinau, it is located in the central part of the country. Chisinau is the industrial and commercial centre of Moldova.

The region has historically been inhabited by a largely Romanian-speaking population. During the centuries the region has been part of the Ottoman Empire, Romanian principality and the Russian Empire before it was incorporated into the Soviet Union. Moldova has been an independent country since 1991.

Building a new national control center is a big event for most countries but for Moldavia it is an extra important development since it will be key for moving the country from its present state to a modern country with extensive and reliable distribution of electricity.

The Power System in Moldova

Electrification of the region started, in a small scale, in the beginning of the 20th century. Most of this infrastructure was destroyed during the Second World War. During the Soviet period major development took place in the power sector. In the period of 1970s -1980s the Moldovan power system allowed the national economy to evolve rapidly. In that period Moldova exported electricity to Ukraine and Bulgaria.

Starting in 1993, the situation in the Moldova power system has deteriorated mainly due to the general economical downturn in the country. The Transnistrian conflict contributed to the negative development as the main production facilities are located in that part of the country. Consequently, in the end of 1990s an unprecedented crisis occurred in the electric power sector of the Republic of Moldova.

To solve the situation, the Government of Moldova launched a program in 1997 for restructuring of the energy sector with the support of the international financial organizations.

The basic goals were creation of the necessary conditions for joining UCTE (today ENTSO-E, the transmission grid system of Europe), increasing the generation capacities and enhancement of the interconnections with Europe in the west. In the same time, it was envisaged to create the necessary conditions for the national power system to start its operation in synchronous mode with Eastern and Western power systems.

For the last years the performance of the Moldovan energy system has became more stable and predictable. The economic recovery and financial improvement of the energy related companies have led to the possibility for the state-owned energy enterprises to reinvest more than in the past.

The total installed production capacity in Moldova is 2980 megawatts (MW) whereof 2520 MW can be related to Moldavskaia GRES power plant located in Transnistria. Only part of the total capacity is in use. Moldova is in fact currently importing electric energy, mainly from the neighboring Ukraine.

State Enterprise Moldelectrica

In 1997, the state enterprise Moldenergo was decentralized and privatized . It was divided into four functional units:

- Power Production
- Power Transmission and Dispatch
- Power Distribution
- Power Related Services

SE Moldelectrica was appointed the responsibility for transmission and dispatch of electrical power in Moldova. The company is under the control of the Ministry of Economy.

The company has currently around 1200 employees with headquarters located in Chisinau. The operations are organized into:

- National Dispatch Center (NDC) located in Chisinau
- Four Regional Control Centers (RCCs) in Donduseni, Balti, Vatra and Comrat
- Fourteen Operational Dispatch Groups (ODGs) organized under the four RCCs

Grid of Moldavian power system:

Voltage kV	Length km	Number of Substations	Installed capacity, MVA
400	214	1	500
330	532	5	2525
110	5 321	166	3687
35	1 378	133	846
6-10	24 499	14698	3464

International interconnections:
- 7 lines 330 kV – interconnections to Ukraine
- 1 line 400 kV – interconnection to Romania – Vulkanesti-Isaccea
- 12 lines 110 kV – interconnections to Ukraine
- 3 lines 110 kV – interconnections to Romania

Moldova's DMTS (Dispatch Monitoring Transmission System) project

Project Background

The World Bank approved a US$35 million loan in 2003 to Moldova. The 40-year loan is provided to enhance the country's power system by upgrading SCADA/EMS, metering system and communication system of SE Moldelectrica.

In an international competition ending in July 2007, ABB was selected as the main contractor in partnership with Eltel Networks company and Landis and Gyr company. The Project is divided into the following packages, with the supply and commissioning of:
- Control Center - ABB Network Manager with SCADA and EMS functionality including control room workplaces and a large wall display.
- Substation Automation - ABB supplied Remote Terminal Units (RTU 560s) combined with digital transducers (REF 54x) used for data collection at 32 substations and power plants.
- Utility Communication - Country-wide data and telecommunication network including a high capacity OPGW-line between Chisinau and Balti. (Supplied by Eltel Networks)
- Metering - Meter asset management and billing system to store all meter data and to provide easy to use validation and reporting facilities. (Supplied by Landis and Gyr)
- Miscellaneous - Emergency power system, air conditioning, building refurbishment and documentation.

ABB was selected as the prime contractor to design the system, interfaces and equipment, supply all necessary equipment and material, install, test and commission all parts of the work to render a completely functional system, i.e, a true "turn-key" delivery.

Current Status of the Project

The SCADA/EMS system has been installed and data engineering work is conducted by SE Moldelectrica's personnel together with personnel from ABB. The first Micro RTUs are also connected to the SCADA system. The large, 5x2 meters, wall display has been installed, but not commissioned yet. The wall display can be seen in the picture.

The Fiber Optic Cable link between the main cities in Moldova, Balti and Chisinau has been installed. Work is ongoing with finalization of access cable to the outstations. Most of the work for the emergency power system and air conditioning has aslo been completed. A Site Acceptance Test (SAT) was recently concluded for the Metering system.

Main activities are now concentrated on the 32 outstations where station adaptation works and installations of the telecommunication, RTU and REF equipment is ongoing. The picture shows some commissioning activities in the yard on the Comrat 110 kV substation.

The current plan is to finalize the project during early part of 2011 when SE Moldelectrica will take over the systems and start to utilize them in their daily activities.

ESB and ABB: a successful and long-term partnership

Company Overview

The Electricity Supply Board (ESB) is the leading company in the Irish energy utility sector and is a statutory corporation which was founded in 1927. ESB is 95% owned by the Government of Ireland, with the remaining shares held by an employee share option trust. ESB is a vertically integrated utility, which comprises of a number of divisions that are ring fenced and operate independently in the electricity market.

ESB Networks, one such division, builds, operates and maintains a nationwide distribution system which includes 170,000 transformers and almost 150,000 km of distribution networks, overhead lines, and underground cables. As owners of the nationwide transmission system, ESB are also responsible for carrying out the construction and maintenance of the high voltage (400 kV, 220 kV and 110 kV) transmission system, comprising over 6,500 km of overhead lines and over 100 large transmission stations. The transmission system is operated by EirGrid, a state-owned commercial company.

ESB Telecom Services operates as a service provider to deliver communications within ESB. There are two types of services, those that connect the corporate network and those which are used for the signaling and control of utility specific operational systems. The operational communications network is designed to provide ESB with a resilient system that will function for eight hours in the event of a blackout of the national grid. All infrastructure deployed in the network is selected as part of a rigorous technical tendering process. This ensures the delivery of a utility specific communications service to ESB; one which is superior to services available on the market. The Telecom Services network comprises a mesh of microwave radio links, polling radio, satellite and fiber based technologies, of which ABB is the principal supplier.

Project

The ABB FOX515 project was initiated in 2003, when a pilot took place to test the teleprotection functionality of the OTERM card between two stations over fiber. The pilot was successful and slowly a managed national fiber network began to grow at a rate of about 30 nodes per year. The Telecoms Operation Center now monitors and provides first level support to the approximately 200 nodes through the FOXMAN management system on a 24 x 7 x 365 basis. The FOX515 over an STM-1 national optical fiber ring is used to deliver TEBIT teleprotection, differential protection, operational voice, SCADA and IP management of critical applications to the National Control Centers and the Distribution Control Centers.

The ESB optical fiber national network is wrapped on the transmission lines. The basic topology is a figure of eight with fiber spurs off the main ring, there is also underground fiber in the metropolitan areas. The FOX515 network interconnects generation stations, transmission stations, office locations and data centers and it offers ESB a suitable medium for the high voltage environment in which it operates. It is planned to grow the FOX515 operational network in line with the demand of

the transmission and distribution network expansion, including the grid connections of the 160 new Wind Farms that are planned to be built in Ireland in the next three to four years.

ESB Telecom Services in partnership with ABB engages in the delivery of extended services into ESB. An example of this has been the design of complex teleprotection schemes.

Service Contract

To keep the complex FOX515 network well maintained and in continuous operation, ABB and ESB have signed a service contract covering remote access services, priority response time, technical support and continuous update/upgrade of the FOXMAN.

Such services delivered by ABB will help ESB to keep the FOX515 network fully in operation and this in turn increases the reliability of the energy supply in Ireland.

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