The customer newsletter
of ABB Switzerland Ltd
Power Electronics Excitation Systems

65|12

UNITROL now

Setting new benchmarks

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Power and productivity
for a better world™

UNITROL now 65|12

Aija Mankkinen
Head of Global Product Line
Excitation Systems

Dear Reader,
Welcome to the latest issue of *UNITROL now*.

We start with our prodcts and technology news. Our cover story - see page 4 - presents the latest member of our UNITROL 1000 family. Alongside the product's innovative features we also highlight a successful pilot project at the Kappelerhof hydro power plant in Baden.
More success stories can be found on page 6 to 10 starting with our new MEGATROL Light through to the UNITROL 6000 products and systems.

Considering that UNITROL M is towards the end of its life cycle - see page 12 - discuss options for upgrading your existing system. Page 14 shows how easy it is to get an offer for a new excitation system and on page 15 you can discover some changes in areas of responsibility within our team in Switzerland. Finally, on page 16 you can find an overview of our training and related schedules.

Last but not least, you will find a review of our presence at the Power-Gen Europe and Powertage exhibitions.

I hope you enjoy reading this issue of *UNITROL now*. If there are any areas you would like us to cover in future issues, please contact me or our marketing and communications manager, Mayerline Jimenez.

Kind regards

Products and technology

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News

Events

New benchmark for AVRs

UNITROL® 1000 - Highly integrated functions ensure most powerful AVR from the leading excitation supplier

ABB launches a new family of automatic voltage regulators (AVRs) that set a new benchmark for indirect excitation systems. The new AVRs, UNITROL 1010 and UNITROL 1020, cover a wide range of applications and set a high bar for functionality, reliability and connectivity. The UNITROL 1000 series are used to control synchronous machines up to approx. 50 MW in industries such as power plants, marine and traction. With a wide range of in-built software functions and Ethernet-based fieldbus, the customer can build highly integrated systems with less wiring and superior availability.

UNITROL 1000 able to manage fault ride through (FRT) conditions imposed by demanding grid codes. Fast detection of network short circuit as well as boost functionality keeps the machine online. Power system stabilizer (PSS) functionality is equipped with injection points as well as test points to verify PSS transfer function.

There are two AVRs in the range. The UNITROL 1010 is capable of 10 A_{DC} excitation current. The light version covers essential functionality for cost sensitive applications including all voltage, field current, power factor and VAR regulation, as well as limiters to keep the machine in the safe operational area and voltage matching for pre-synchronization.

The basic version covers fieldbus interface, rotating diode monitoring, reactive load sharing with constant bus bar voltage and extensive monitor and protection functions, for building up reliable dual channel systems. An auto-synchronization function is available as an option.

The UNITROL 1020 is capable of 20 A_{DC} excitation current and comes with a local human machine interface. The units cover higher excitation current and feature extended integrated software for more demanding applications. The basic version has the same software functionality as the UNITROL 1010. The full version offers auto-synchronization, event and data logger, as well as time synchronization via simple network time protocol (SNTP) signal. PSS is available as option.

UNITROL 1010 and UNITROL 1020 are certified according to CE regulations, DNV class society regulations and cUL (CSA compliant UL). The product successfully passed extensive type tests and can be operated in an ambient temperature of -40°C to 70°C.

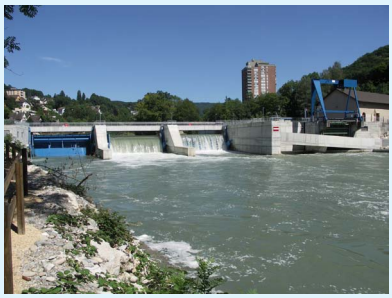
All UNITROL 1000 products are delivered with the user-friendly CMT1000 commissioning and maintenance tool. The tool is used to setup parameters and tune the PID to guarantee stable operation. CMT1000 software allows an extensive supervision of the system that helps the user to identify and locate problems during on-site commissioning.

ABB's global excitation service network guarantees local professional technical support as well as commissioning service.

UNITROL 1010 and UNITROL 1020

+ AC or DC power input
+ Output current up to 40 A at 300 V
+ Modbus TCP serial communication
+ Powerful commissioning and maintenance tool (CMT) over USB
+ Wide range of integrated functions including
  + Rotating diode monitoring
  + Automatic synchronizing
  + Power system stabilizer (PSS)
  + Event and data logger
  + Extended monitor functions for dual channel systems

Latest UNITROL 1000 automatic voltage regulator helps to power the city of Baden



The Kappelerhof hydro power plant, operated by the utility Limmatkraftwerke AG, provides electricity to the city of Baden in Switzerland.

The hydro power plant, located on the river Limmat, was the first power station constructed by ABB (at that time BBC) in Switzerland in 1891. The plant has an output capacity of 2 x 6,8 MW and supplies electricity to the city of Baden that has around 18,000 inhabitants. At the end of 2011 ABB Excitation Systems supplied the power plant with their latest product - the UNITROL 1020 automatic voltage regulator - to replace the 30 years old UNITROL M AVR that had come to the end of its life cycle. Limmatkraftwerke AG is completely satisfied with the UNITROL 1020 AVR because of its accurate performance and the good experience the utility has had so far. The customer also pointed out the pleasant cooperation with the ABB project team.

"UNITROL 1000 products are showing excellent performance, particularly where reactive load sharing and fast synchronization are required," says Rudolf Moeckli, Product Manager of UNITROL 1000 range.

The perfect fit for Kyndby Power Station

The flexible MEGATROL Light - the newest and smallest of the MEGATROL product family - is successfully commissioned.

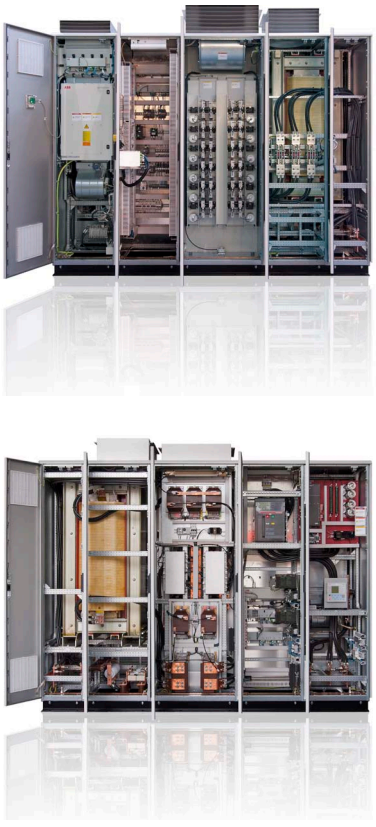
Text Tobias Keller

Imagine you are planning to upgrade your small gas turbine's static starter and excitation and you need a solution that fits into the available limited space and matches existing cables.

That solution is MEGATROL Light, the smallest and newest member of the MEGATROL product family. Its flexibility comes from its modular cubicles which can be arranged in many different ways and are simply connected together with cables. Even the DC-link connections are made with cables, a total novelty in ABB starter design.

This flexibility is one of the main advantages during the execution of the pilot project, the installation of a MEGATROL Light in the upgrade of Kyndby power plant in Denmark. Kyndby Power Station, in Hornsherred, is the emergency and peak load facility for Zealand. This means the facilities at Kyndby Power Station can be started up within minutes if operational irregularities occur in the high voltage electricity grid or problems arise at other power stations.

MEGATROL Light is able to provide a starting power of up to 3 MW on 2 kV and excitation currents up to 1,500 A on 690 V. The power station operates a 734 MW capacity, distributed on five different production units, the largest being two oil-fired steam power units – peak load facilities each having a capacity of 260 MW. Two oil-fired gas turbine units of 63 MW each constitute the remaining peak load facilities at Kyndby Power Station. Kyndby Power Station also controls a 70 MW gas turbine, which is situated at Masnedø CHP plant. The 63 MW gas turbines at Kyndby as well as the 70 MW gas turbine at Masnedø are now equipped with MEGATROL Light units.



Front and back view of MEGATROL Light

Made-in-China - serving the world

ABB has completed the commissioning of its first Chinese made UNITROL® 6800 for a power project in Mongolia

Text Jocelyn-Ting Zhang

The Excitation Systems team of LBU Power Electronics & MV Drives achieved its first success in the Chinese year of the Dragon recently when it commissioned the first ABB UNITROL 6800 made in China for Mongolia's 4# thermal plant.

Local production guarantees a shorter lead time, a more customized solution and a quicker response to customer requests in installation and commissioning. Through close monitoring of each project phase - purchasing, design, assembly and testing - the ABB excitation team reduced the lead time by three months but was still able to meet the customer's expectations of functionality and quality.

As the largest coal-fired power plant in Mongolia, the Mongolian 4# thermal plant is equipped with six power generation systems, providing the Mongolian Center Energy System with 70 percent of its electricity and supplying the Ulan Bator Center Heating System with 65 percent of its heat. However, old equipment and lack of spare parts caused a number of shut downs, making it impossible to provide a continuous power supply.

Replacing the existing equipment with the AC 800PEC control panel, a member of the UNITROL 6000 series, made use of ABB's world leading semiconductor technology, ensuring reliable and safe operation of the generator and power grid. In this project, the local excitation engineering team worked closely with the global product team to prove the feasibility of switching automatically between the main excitation system and the back-up one in the event of failure. Additionally, the optical communication linking the site to the main control room enables remote control, giving a direct, real-time view of the plant's operational status. In this way, the UNITROL 6800 enhances the efficiency of plant operations significantly.

The Mongolia 4# thermal power plant ordered two sets of ABB excitation systems, with the set currently in operation being the first set produced locally in China. The second set will be ready within the next two months.

Bing Kong, General Manager of Local Business Unit Excitation Systems, comments: "This year we will provide the localized UNITROL 6000 series excitation systems to the Indonesia Chervon power plant, the Sinkiang Dushanzi Petroleum Chemical Plant and the Guangdong Qingyuan pump storage plant, as well as several others. We will continue our relationship with our customers through effective communications and will convince them with our reliable, high quality products, our competitive pricing strategy and our localized service."

Pro-active approach wins upgrade project

Duke Energy to get latest UNITROL 6080 excitation systems

Text Daniela Cristinziani

A pro-active approach, combined with an appreciation of the customer's needs, has resulted in ABB winning a major upgrade project for a US power plant.

Since the 1900s Duke Energy's mission has been to make individuals' lives better by providing gas and electric services in a sustainable way. Located in Trenton, Ohio, this power plant operates six ABB UNITROL M excitation systems. In 2010, Duke was approached by ABB's North American service team with a proposal to upgrade the company's six UNITROL M 120 MW generator (gas turbine) excitation systems, which were nearing the obsolete phase. The project would involve upgrading all six systems to the latest UNITROL 6080 technology.

Prior to sending the quote the excitation systems team visited the site and presented the proposed project. ABB Canada also provided a one day training session for Duke Energy's project engineers and his staff to ensure they understood the basics of an excitation system.

ABB's engineering team worked closely with the service team to analyze all technical aspects, allowing them to foresee any complications and provide the necessary solutions. These efforts ensured that Duke Energy appreciated the many benefits the new system would provide, with the result that the company approved the recommended control upgrade for the six excitation systems.

The ABB team has demonstrated that perseverance and determination along with unsurpassed teamwork can win a bid.

Indicating that price is not always the driving factor. ABB Canada will deliver two units per year, the first delivery took place in June 2012.

UNITROL M before the control upgrade

UNITROL M after the control upgrade with the latest UNITROL 6080 control unit

UNITROL M voltage regulators and SYNCHROTACT 3 synchronizers are widely used around the world. With their purely analog technology they will pass into the obsolete phase of the product life cycle.

Life cycle note

Text Marc-Julian Herrmann, Andreas Mueller

As a modular, flexible and highly reliable control platform, UNITROL M and SYNCHROTACT 3 modules have been used in a variety of applications, ranging from small indirect regulators of motors, to large static excitation systems in nuclear power plants, as well as for synchronizing generator circuit breakers and line circuit breakers.

Almost 15 years after the end of mass production, ABB is still offering services and spare parts for these products to ensure safe and reliable operations of customers' installations. UNITROL M and SYNCHROTACT 3 will pass over into the obsolete phase by end of 2013.

One of our key targets is to keep end-users fully updated about the status of their equipment. For this reason we have developed a proactive life cycle communication concept, making it possible to inform our customers in advance about any changes in the life cycle status of their assets.

ABB's Product Life Cycle Management model describes the availability of systems, services and spares over the complete life time, helping customers plan their operation and maintenance strategy.

The risk of failures related to the aging process of electrical components, possible deviations of analog measuring circuits or the decreasing reliability of protection settings can lead to unexpected downtime or unpredictable behavior of the assets. Ultimately, this risk can have a negative impact on revenues.

Meanwhile, various aspects such as the expected remaining life time of other surrounding equipment, the availability of spare parts and the possibility to retain product expertise within the operator team have a major effect on determining how equipment is operated in a late stage of the life cycle.

To ensure product reliability and optimum performance, ABB proposes three possible options for a reliable operation of UNITROL M equipment. Depending on customer circumstances as described above, either one of these can help in planning the remaining life time of an

UNITROL M based excitation system:

1. Performance review, backed up by spare part management
2. Control upgrade, which involves upgrading of the UNITROL M control platform to an active platform while keeping the legacy power converters
3. Retrofit, which involves complete replacement of the excitation system with one of the active systems - UNITROL 1010, UNITROL 1020 or UNITROL 6000

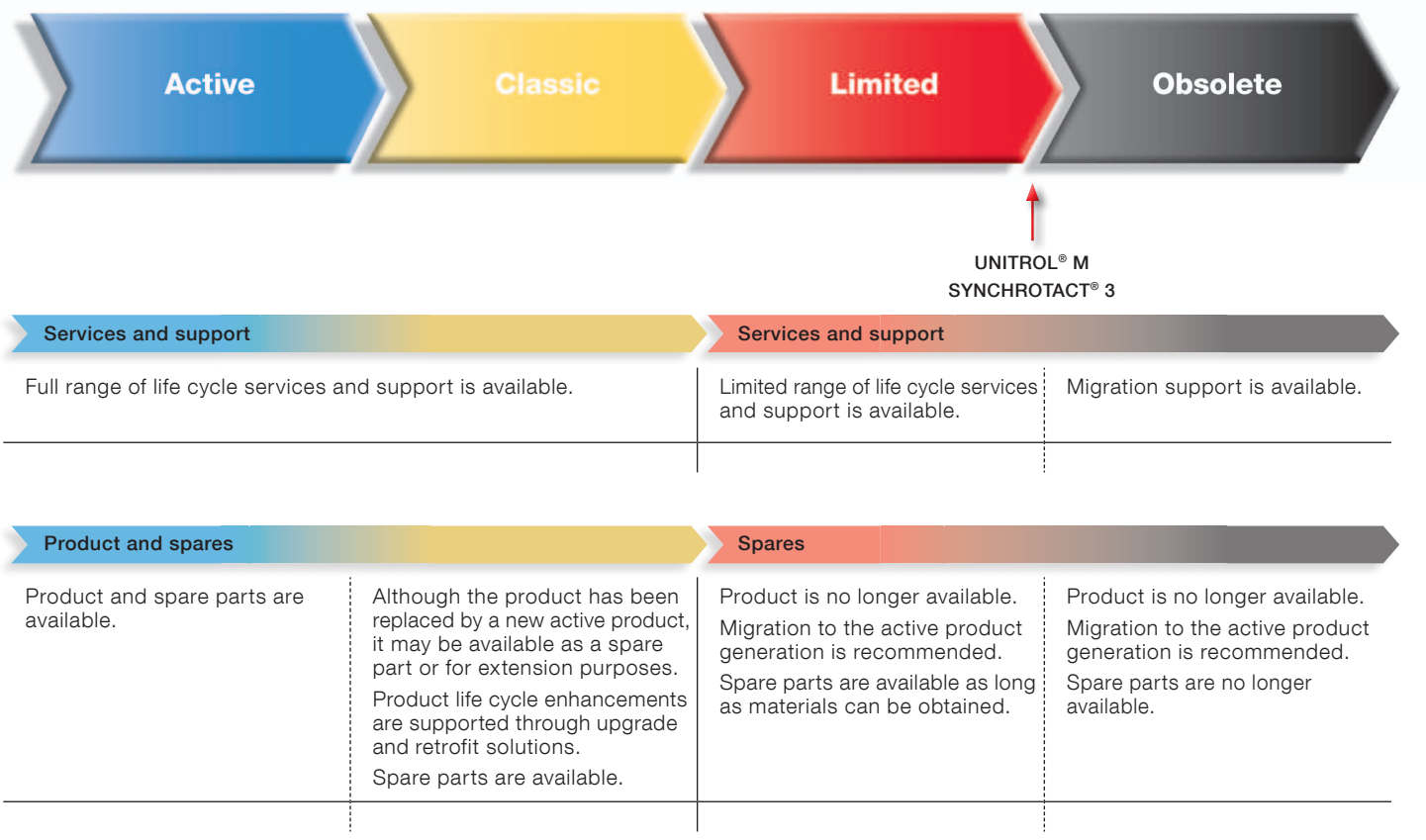


ABB has developed a performance review program for all UNITROL products, designed to increase the reliability of its customers' assets through preventive maintenance of all elements of an excitation systems suffering the effects of aging. In addition, all available spare parts will be assessed and complementary spares will be recommended. Furthermore, to ensure the correct and safe operation of the system, all critical protection devices and system settings in various operating conditions will be tested. The performance review will identify possible improvements to increase the overall performance of the system. These could include software upgrades or modernization of equipment. In order to maximize the benefits from a performance review various optional service offerings such as power system stabilizer (PSS) compliance test and instruction of operator personnel can be considered.

An alternative option would be to perform a control upgrade including the replacement of the legacy content of the control cabinet with the new UNITROL 6000 control platform while keeping the existing power converters in operation. ABB has designed a standardized control upgrade concept which is pre-assembled, wired and tested in the factory and then installed and connected to the original customer terminals in the existing control cabinet. This option allows the customer to move to a currently supported control platform at a reduced cost compared to a full replacement. The reliability of the installation can be increased and the availability of spare parts and product expertise ensured. The larger the existing system (for example, the number of converters) and the better the condition of the system, the more interesting the upgrade solution will be.

As a third solution, ABB offers the option to migrate not only the controller but also the complete excitation system to an active product family by performing a retrofit. The clear advantage of this approach is the availability of all types of features and services. Depending on the size and configuration of the UNITROL M system, either UNITROL 1020 or UNITROL 6000 will be recommended. The newly released UNITROL 1020 covers the range up to 20 A and offers a wide range of features.

For larger applications and technically more demanding solutions, the extremely flexible and powerful UNITROL 6000 product range would be most suitable. With a retrofit, the risks associated with equipment in a late stage of the product life cycle can be removed, while ABB's active platforms are more likely to offer the complete range of features required by the application.

In the case of SYNCHROTACT 3, ABB offers two possible replacements either of the electronic device or the complete synchronizing system.

UNIsmart

Easy configuration for the UNITROL® 6000 system with the new product configurator solution

Text Stephan Egli

Lead times to build new plants or to retrofit existing assets are becoming ever shorter, in turn squeezing response times to customer enquiries. Despite this, commercial and technical information still needs to be detailed and tailored according to the required solution.

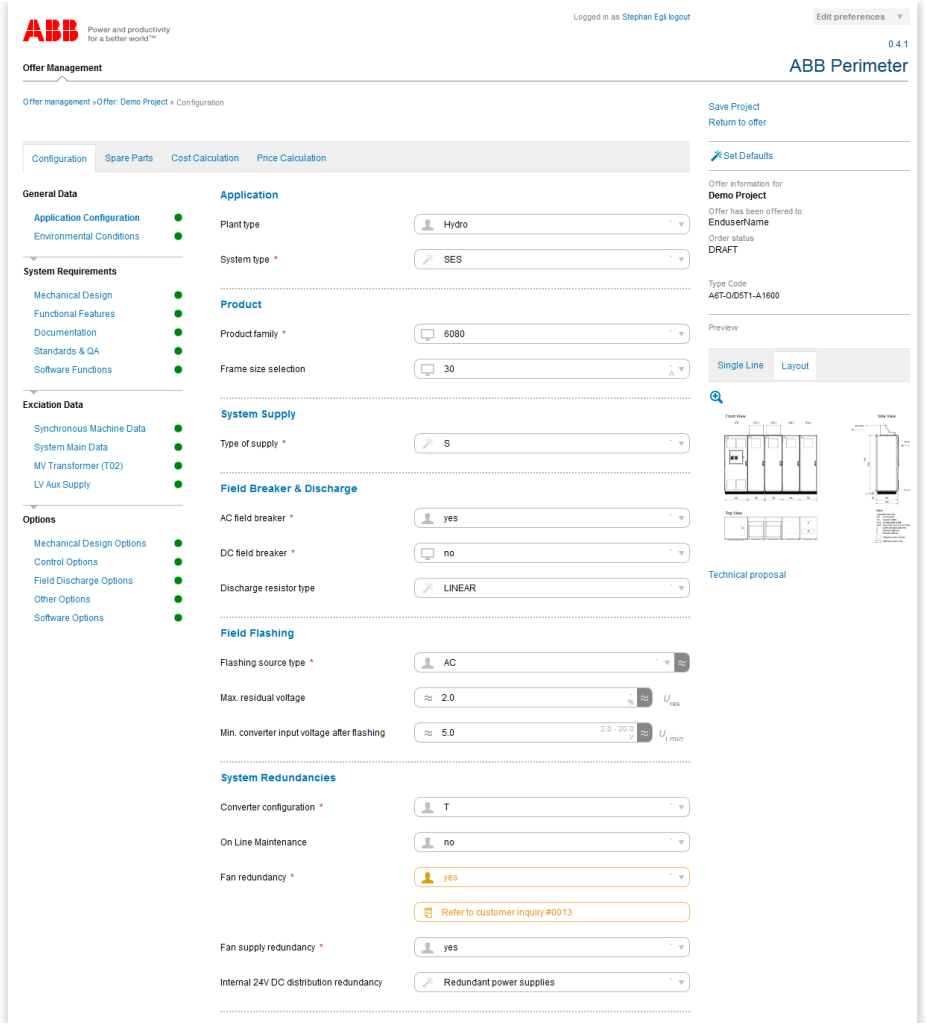
Moreover there are often specific technical as well as commercial issues to be clarified with different specialists within the ABB organization. These colleagues need access to detailed information about the system to be offered and there is often no time to capture all of the required information first.

When it comes to an order, sales engineers need to hand-over actual, consistent and complete information about the offered system to the engineering team.

These challenges are now easier to meet with the implementation of the UNIsmart, an integrated and web-based solution globally accessible via the Internet.

The UNIsmart will enable sales engineers to respond to customer enquiries even more quickly, providing detailed and tailored offer documents and system specifications.

Easy collaboration between sales, project management, engineering and support team is another key benefit of this solution. The integrated solution offers management, product configuration and dimensioning, cost and price calculation, generation of offer documents and technical reports, as well as support interfaces to engineering and production tools.



Running prototype of the UNIsmart

Benefits

- Quicker sales response to customer
- Customized products according to customers' needs
- Complete and consistent system specification
- Seamless hand over from sales to project execution
- Integrated tool environment
  - Offer management
  - Product configuration and dimensioning
  - Cost and price calculation
  - Generation of offer documents and technical reports
  - Interfaces to engineering and production tools
- Support of bid and proposal, engineering and support processes
- Global solution accessible online
- Integration of system dimensioning tools (ERRSYS and AVRSYS)

Organization update
Excitation Systems in Switzerland

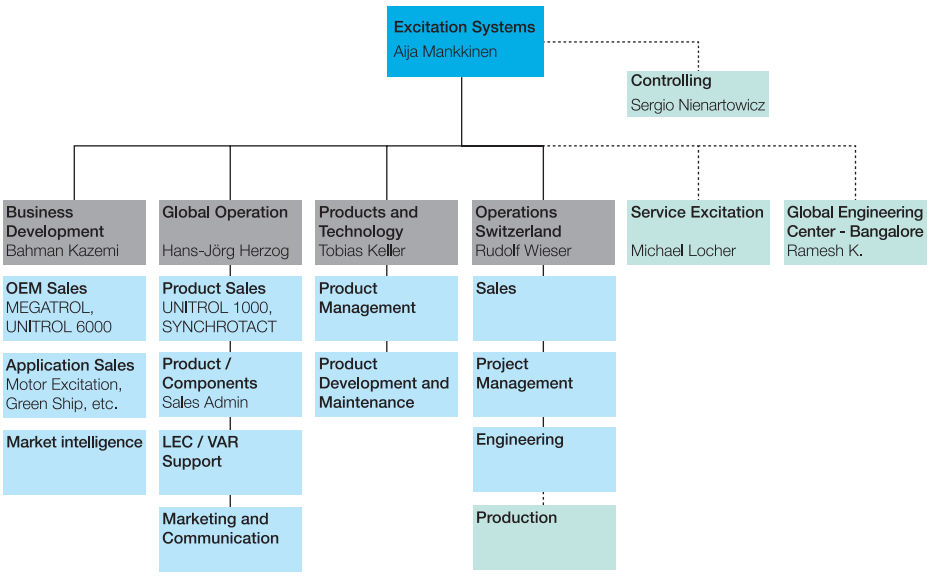
This January saw a number of organizational changes in the Excitation Systems team in Switzerland.

Bahman Kazemi took over as Business Development Manager from Fariborz Shokoofh who retired end of 2011. In addition Bahman focuses on OEM account development and is supported by Suresh Kunhallar, who takes the role of OEM Sales Manager.

The new head of Products and Development is Tobias Keller, who was previously responsible for the Development and Support team. Rudolf Wieser, his predecessor, has been appointed as Head of Operations Switzerland.

To strengthen our sales in the product business, Laszlo Matucza is now responsible for the OEM sales for UNITROL 1000 and SYNCHROTACT.

Our people work together seamlessly to deliver benefits for our customers. Our way of doing business is value-based, leadership-driven and performance-oriented. With our global presence, application knowledge and local expertise, we offer excitation and synchronization products and systems as well as services that allow our customers to improve their operations – whether they need to increase the reliability of a power grid or raise productivity in a factory.



Organization chart of Excitation Systems in Switzerland

Reinforced Business Development Team

Suresh Kunhallur joined the Business Development Team in March 2012 with a focus on OEM Sales.

Suresh holds Bachelor's and Master's degrees in electrical engineering. Before joining ABB for the first time, he gained valuable experience as an operations engineer in a power plant for five years and also spent three years as a consultant engineer in the specification and design of power plants.

At ABB in Saudi Arabia, Suresh started as BA Manager in transmission followed by Division Manager for MV switchgear and control. From 1996 to 2006 Suresh worked for ABB in Switzerland, first as Area Sales Manager in the field of protection and substation automation and later for many years as Head of Sales and Marketing for the same product group, protection and substation automation.

For the last five years, Suresh has worked as Insurance and Claim Manager with an insurance company for power plants. With his huge experience in different positions in the power plant business, Suresh will make a major contribution to implementing our growth strategy in the OEM / green field business.

Training course offerings
Time to learn

ABB training courses help customers increase their return on investment, reduce down time and improve the skills and motivation of their personnel.

Training participants profit from our extensive experience and modern training infrastructures which enable them to:
- efficiently operate and maintain ABB power electronic systems
- troubleshoot problems faster
- extend the lifetime of the ABB power electronic systems

Education profile
The training courses are offered as standard versions or specifically tailor made to meet the needs, requirements and know-how of our customers.

Next standard courses and dates
J990 Excitation Systems and Synchronous Machines Fundamentals
11 – 12/10/2012
CHF 1,970 per person

J131 UNITROL 1010/1020 Service and Commissioning
04 – 07/09/2012
CHF 3,950 per person

J900 SYNCHROTACT 5 Operation and Commissioning
13 – 14/09/2012
CHF 2,190 per person

Training locations
ABB Power Electronics training is conducted in its well-equipped Learning Center in Switzerland or on-site at customer's premises by highly qualified instructors.

Information on training courses, such as course descriptions, prices, schedules and registration forms, can be found through our course locator on the ABB University web portal:
www.abb.ch/abbuniversity

For customer tailored training, please contact:
Training-for-Power-Electronics-and-MV-Drives@ch.abb.com

Power-Gen Europe 2012
Integrating the power sector

ABB was at the Power-Gen Europe 2012 Conference and Exhibition from June 12 to 14 at the Koelnmesse in Cologne, Germany.

ABB was part of the industry's leading conference and exhibition, co-located with Renewable Energy World Europe and Nuclear Power Europe. Celebrating the 20th anniversary, Power-Gen Europe comprised a busy exhibition floor backed up by a high-level conference featuring strategic and technical presentations in power generation, transmission and distribution.

On the ABB booth the company's unmatched portfolio of products, solutions and services which meets the current and future market challenges were showcased. The new UNITROL 1010 and UNITROL 1020 with their wide range of features and benefits were presented. A live demonstration gave a real impression of the new integrated functions and the accurate performance of the new UNITROL 1000 family members.

In general the innovative focus was on the Symphony Plus control system, gas fired as well as renewable generation and energy storage solutions. This power system portfolio has been supported by state of the art power products on display from the areas of machines, generators, switchgear as well as automation products. Both product categories demonstrated ABB's commitment to help our esteemed customers in improving operational cost, increase energy efficiency. ABB's process expertise can make an important contribution towards climate protection.

Power-Gen Europe offered a platform for representatives from governments, institutions and industry to assess the current and future developments with around 600 exhibitors and more than 13,000 visitors from over 100 countries.

Powertage 2012
Solutions for our Energy Future

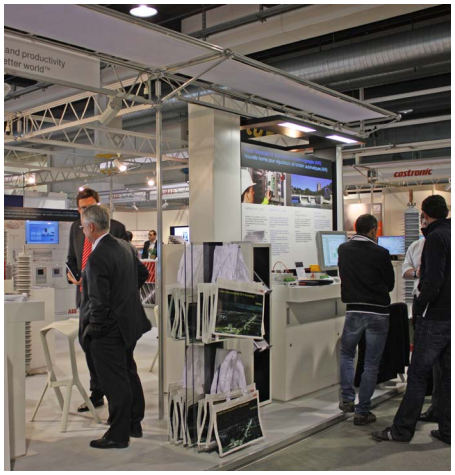


ABB showed its latest innovations for power plant control and electrical systems at Powertage 2012. Held in Zurich, this fifth event attracted over 2,000 representatives of the Swiss electricity industry to visit the 150 exhibitors.

A wide portfolio of products and systems were showcased on the ABB booth. Some of the Excitation Systems and Power Electronics Services experts presented the new UNITROL 1000 family members and the latest Product Life Cycle Management concept.

The three day programme offered an established insight in the fields of power generation, transmission, distribution, trade and sales, engineering, e-mobility infrastructure and services. Overall, this event was an important exhibition and conference for the Swiss electricity community, offering a forum to discuss the approaches that could define a sustainable energy future.

Upcoming Events

FENASUCRO AGROCANA
Exhibition
São Paulo, Brazil
August 28 - 31, 2012

RIO OIL & GAS
Expo and Conference
Rio de Janeiro, Brazil
September 17 - 20, 2012

MEGATROL. The smartest way to start gas turbines and excite your generators.

MEGATROL is a compact and scalable solution that combines the UNITROL® 6000 static excitation system and the MEGADRIVE-LCI static frequency converter in one power package. Thanks to the smart cross start feature, MEGATROL allows you to start gas turbines whenever you want, including the peak hours when power supply is crucial. To find out more, visit www.abb.com/unitrol

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