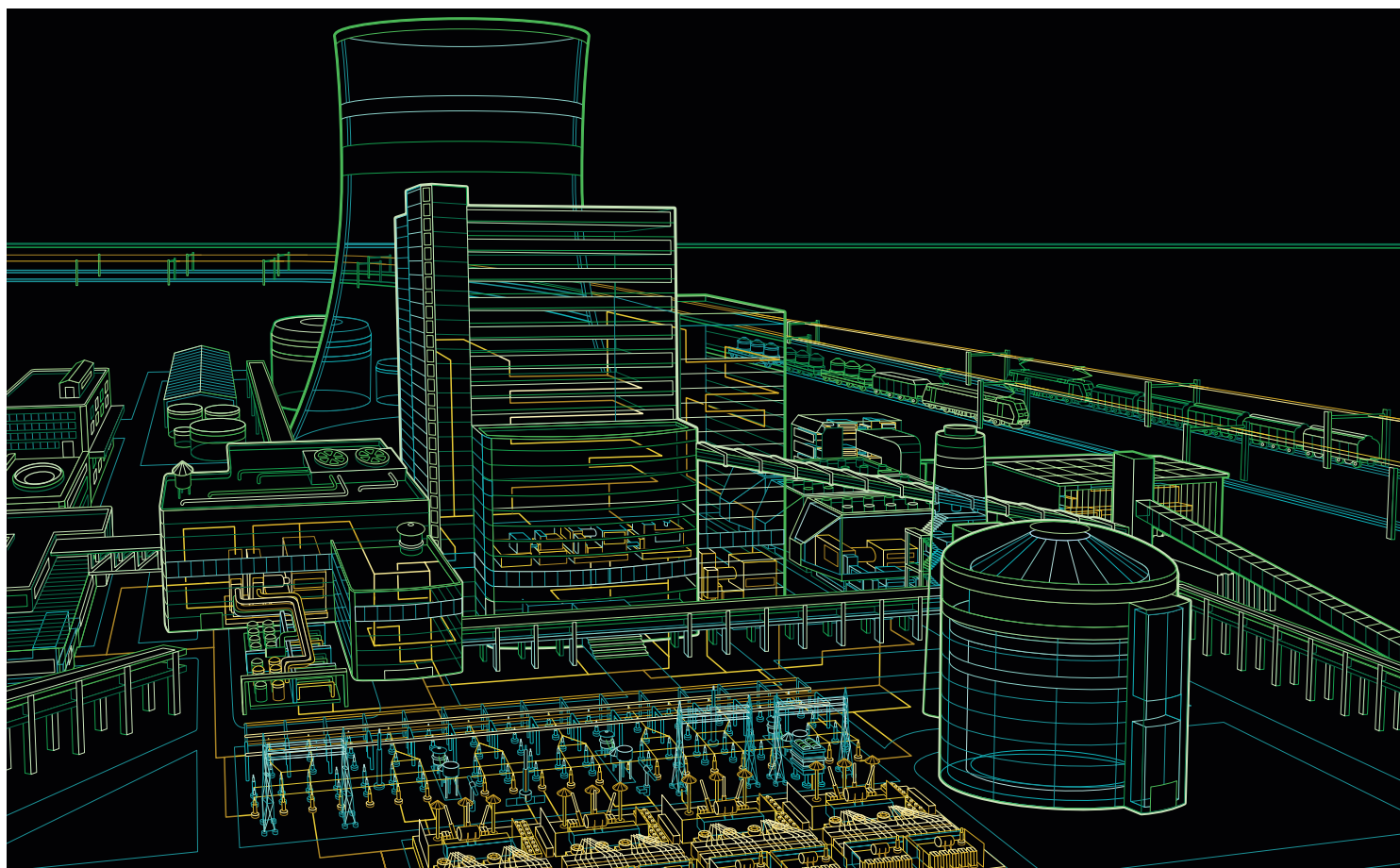


UNITROL now



Exciting the world of machines

Motor excitation 04

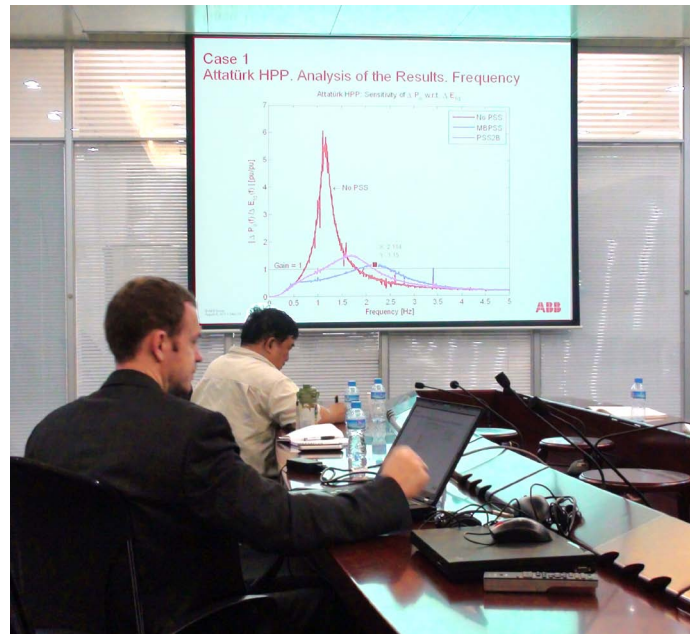
Optimal solution for a wide range of applications

Green ship 08

UNITROL-based distribution grid brings 20% efficiency increase

New Head of Excitation Systems 12

Aija Mankinen shares her early thoughts on the business



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Motor excitation

Proven flexible solutions for motor excitation

06

UNITROL 6000 certification

Independent testing proves excitation systems

UNITROL now 64|11



Aija Mankinen

Head of Excitation Systems

Dear Reader,

Welcome to the new issue of *UNITROL now*. We plan, on a regular basis, to bring you the latest news, views and developments surrounding ABB's excitation systems.

We start, in this issue, with a look at motor excitation – see page 4 – and the many benefits that it brings to synchronous motor applications throughout the metals, power, cement, paper and oil & gas industries. Common to all these industries is the need for stable networks which can be met by using automatic regulators.

ABB's wide experience in supplying excitation systems for synchronous motors ensures a system that provides a gentle start-up together with a safe motor operation.

Page 6 describes the recent successful certification of an excitation system in China, while on page 7 we report on

some excellent performance tests that have been carried out.

A recent example of excitation systems in practice is highlighted on page 8 where we look at ABB's highly efficient on-board DC system.

Finally on page 14 we review the recent, and highly successful, ABB Automation & Power World in Beijing, New Delhi and Zurich.

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 whose details are shown on page 10.

Kind regards



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Power World 2011

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Green shipHighly efficient power distribution and electric propulsion for a
wide range of vessels**Application****04 Motor excitation**Automatic start and smooth operation for
synchronous motors**Product and technology****06 UNITROL 6000 certification**

Successfully tested by Chinese institute

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Sharing knowledge and best practices



UNITROL® motor control

Text Wolfgang Knapp

As simple as pressing a button

Synchronous motors are used throughout industry to drive large pumps, fans, mills, crushers and other heavy loads. Their benefits include an outstanding efficiency and the ability to compensate for inductive or capacitive reactive power in the grid caused by asynchronous machines or long transmission lines.

Now imagine the harsh grid conditions on a remote industrial site where heavy loads are frequently connected directly on-line and off-line. A large synchronous motor on the same grid, excited with an UNITROL system, can reduce transient impacts to a minimum and help maintaining the appropriate voltage profile. And the control of this motor can be as simple as pressing a button.

Access to this high level UNITROL motor excitation performance is now easy and affordable. Based on UNITROL 6080, a range of six motor excitation systems with field currents from 20 to 770 A, are available within three months from order.

The units are assembled and tested at ABB's DC-drives factory in Ladenburg, Germany and are directly dispatched to local engineering centers worldwide. As such, UNITROL systems benefit from

the volume production of DC drives along with a high European component content.

The integrated start/stop sequence, which can be easily adapted to many applications by simply adjusting parameters, is ideal for system integration.

After closing the motor breaker the sequence automatically handles all excitation and handshaking tasks until the rotor is up to speed and is gradually synchronized to the grid.

Another feature coming soon, and which may have a large impact on commissioning, is the excitation control terminal (ECT) software upgrade. ECT is expected to bring many productivity improvements and new functionality and will be sufficient for commissioning of common motor excitation systems.

UNITROL® 6080



- + 64 bit floating point CPU
- + No restrictions regarding data scaling and range
- + Fast and precise measurements and control scheme
- + Compliant with international and local standards
- + Fully compatible with ABB's Extended Automation System 800xA

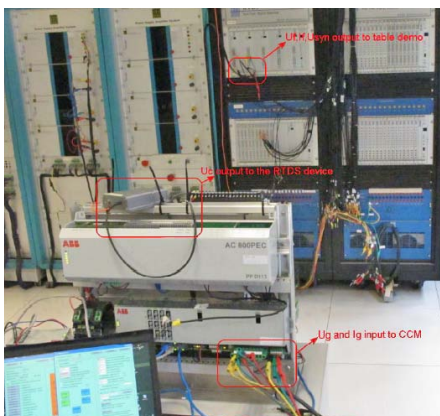
UNITROL 6000 successfully certified

The hardware and software of the UNITROL 6800 and 6080 regulators have been subjected to extensive testing at the North China Electric Science Research Institute (NCESRI), a subsidiary of the State Grid Corporation of China (SGCC).

Testing included:

- AVR control for static and indirect excitation systems
- High initial response (HIR) control for indirect excitation systems
- PSS type 2B and 4B as well as various limiter functions

In addition steady-state and dynamic system response is validated against the documented computer representation resulting in a very good match.



UNITROL 6000 under test in China.

Overall, the performance and the test results were deemed “excellent” by the institute – wording which once again demonstrates the high performance capability of the UNITROL 6000. The final report will be available soon.

Congratulations to the ABB teams in China (Aleck-GuiSen Zhu, Ryan-Xin Xiong, Soonphone-Feng Song) and Switzerland (Matthias Baechle, Rudolf Wieser, Valerijs Knazkins) who have achieved this great success.



The North China Electric Science Research Institute (NCESRI): location for the extensive hardware and software testing of the UNITROL 6800 and 6080 regulators.

News

UNITROL 1000

ABB's latest automatic voltage regulators, UNITROL 1010 and UNITROL 1020, are designed for indirect excitation of generators and motors in marine, wind, oil & gas and land-based power plant applications. A built-in power system stabilizer and accurate simulation models contribute towards meeting the most demanding grid codes. The new UNITROL 1000 series is available from January 2012.

ECT

The powerful industrial PC, UNITROL excitation control terminal (ECT), is used for monitoring and controlling the UNITROL excitation systems. It can be located at the excitation system as a door panel for local control and / or in the central control room for remote operation.

The ECT is optionally provided with UNITROL 5000 and UNITROL 6000 systems or can be added to such systems at a later stage.

MEGATROL

MEGATROL is a compact and scalable solution that combines the UNITROL 6000 static excitation system and the MEGADRIE-LCI static frequency converter in one power package. With its smart cross start feature, the MEGATROL can start gas turbines whenever needed, even during peak hours, when the power supply is crucial. A new compact version for low power applications - MEGATROL Light - will be available during the second quarter of 2012.



UNITROL 6800 for Sanmen in China



Parallel breaker arrangement

Type-testing an 11,000 ADC excitation system

Heat run pushes the boundaries

Text Tobias Keller

The increasing size of power plants is reflected by the 1,400 MVA generators now being introduced, particularly in nuclear stations. With these larger generators comes the demand for high power excitation systems.

Typical for these demands is the nuclear power plant Sanmen in China. The plant is equipped with two pressurized water reactors and two 1,400 MVA generators. They require 10,200 A rated field current and 18,530 A ceiling current for 20 s with a rated field voltage of 560 V. The latest UNITROL 6800 static excitation systems are chosen to meet this demand.

The sheer size of the system is impressive: 11 meters long, weighing more than

15 metric tons and featuring seven UNL14300 power modules (n-2 redundancy) with two 8,000 A breakers in parallel. Yet an even bigger challenge came during the design phase. ABB was asked to adapt the standard UNITROL line up so that the UNITROL 6800 could be upgraded to 12,000 A. Remarkably, this significant power increase is met with just a moderate increase in cabinet depth to 1,200 mm.

The system was subjected to extensive performance testing in ABB's test bay at Turgi, Switzerland. Two heat runs, lasting six hours each, were carried out and included testing the thermal behavior, losses and current equalizing among the parallel converter bridges. A special low voltage, high current transformer

and two DC-reactors, mounted on top of each other, were used as test equipment for up to 11,000 A.

Many tons of copper were used to connect the transformer with the excitation system and the DC outlet with the DC reactors. All tests were passed successfully and showed the excellent performance of UNITROL excitation systems.



Offshore support vessel, a typical application for ABB's onboard DC system.

Green ship – UNITROL systems help vessels to 20% efficiency increase

Text Tobias Keller

In May 2011, ABB announced the introduction of a new direct current (DC) electrical grid for marine applications. The new DC distribution provides power without intermediate AC to DC conversion. The result is highly efficient power distribution and electric propulsion for a wide range of vessels.

Traditionally, some 80 percent of a vessel's electric power is consumed by thrusters and electric propulsion drives, via multiple DC connections from the AC supply. The new concept sees the generator connected directly to the DC distribution grid through the integration of the synchronous generator's excitation system and the main rectifier.

This combined system consists of an UNITROL 6080 generator excitation system and an UNITROL 6800 control system which is used to control the main rectifier - ie, UNL14300 power converter.

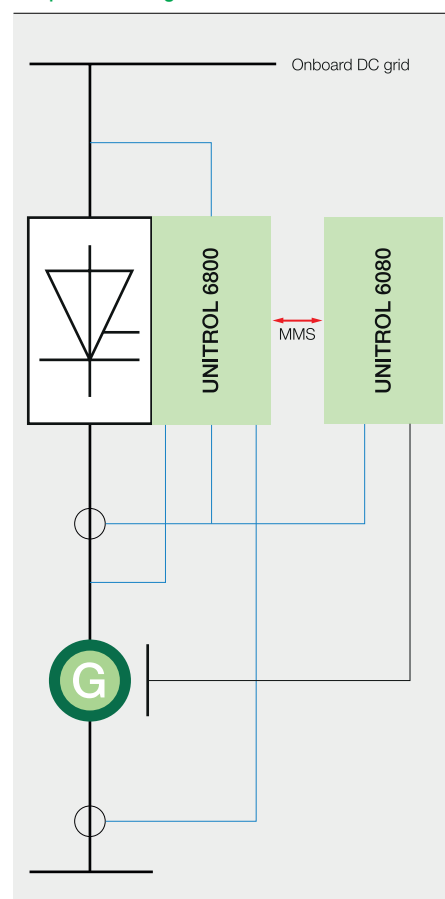
This combination typifies the benefits of the UNITROL 6000 family including the ability to directly implement protection functions along with reliable and fast communication between different controllers.

The main advantage of such a DC power system is that the ship's generator engines no longer have to run at a fixed speed. Thus the engine's speed can be adjusted to optimize fuel consumption. Also by eliminating the need for bulky transformers and main switchboards, the footprint of the electrical equipment

is reduced by up to 30 percent. That provides more space for passengers or cargo and provides greater flexibility in the positioning of system components in the vessel.

ABB's onboard DC system provides further fuel savings by enabling supplementary DC energy sources such as solar panels, fuel cells or batteries to be connected directly into the ship's new electrical system.

Simplified arrangement



Grasping market needs in South Asia

In March 2011, Jean-Sébastien Perez joined the System Sales Group as Area Sales Manager for South Asia and as Key Account Manager for Alstom Gas.

Jean-Sébastien is from Alsace, a famous region of France. After graduating with a Master's degree in electrical engineering from the INSA University of Strasbourg, he started his career at Alstom in Baden as work package owner for excitation systems. This was followed by a position as Lead Engineer for the gas turbines electrical auxiliaries, where he acquired strong technical skills and project management capabilities.

Jean-Sébastien is excited by his new challenges at ABB: "Now have more di-



Jean-Sébastien, Area Sales Manager for South Asia.

rect contact with the market and get a better understanding of precisely what it needs. This should help me to develop

a deeper commercial understanding and help reinforce our position in South Asia, where the market is promising."

Speaking your language in China and Switzerland



Luc Curchod, Area Sales Manager for China and Switzerland

Luc Curchod started in the System Sales Group in June 2011 and is responsible for the Chinese market and the German speaking region of Switzerland.

He studied at the ETH in Zurich and holds

a Bachelor degree in mechanical engineering as well as a Masters degree in management, technology and economics.

Luc joined ABB as a trainee in 2007. His assignments included periods in the sales

department of turbo systems, where he lead international teams in China, Japan and Switzerland. Later Luc joined the HV products service department where he developed a service business model for the Chinese market.

Before joining excitation systems, Luc worked as assistant to the country executive team of ABB Switzerland.

Luc is excited to be in his current position, seeing an opportunity to work directly with customers and focus on their needs. In order to serve the customer in the best possible way, Luc says it is crucial to understand and respect existing cultural differences. This is why he is studying the Chinese language.

Bridging the sales gap for Turkey and the Middle East

Aytug Okumus, who joined the sales team in September 2011, is responsible for the development and performance of all sales activities in Turkey and the Middle East. He recently moved with his family from Istanbul to Switzerland for this new challenge.

Aytug holds a Bachelor degree in electrical engineering from the GAZI University of Ankara. He started working for ABB in Turkey in 2004 as a Service Engineer for electrical motors and generators. Following this he worked as a Commissioning Engineer for excitation systems until May 2010. During the past year in Turkey, he worked as Power Generation Service Manager.

Aytug is enthusiastic about his new challenges in the System Sales Group and believes that his time with power systems has prepared him well: "It is im-

portant for me to reach the sales goals between existing and new customers in a confident way."

His long experience with ABB and significant knowledge about excitation systems are a good foundation for building

strong customer relationships. For him it is clear: "Our systems are the heart of power generation."



Aytug Okumus, Area Sales Manager for Turkey and the Middle East.

Enhancing stakeholder value with improved marketing communications

Mayerline Jimenez started as Marketing and Communication (MarCom) Manager for excitation systems in the global operations team in August 2011.

Following several years working at ABB, Mayerline gained a solid background in marketing and communications.

Originally from the Dominican Republic, Mayerline started her career 10 years ago with a commercial apprenticeship at ABB. After completing her education, she worked at ABB University, within the training center for power electronics and MV drives as Sales and Training Coordinator. Mayerline kept up her studies resulting in a role as a Junior MarCom Manager. She left ABB for a short while to gain new, practical experiences in marketing.

Returning to ABB, Mayerline worked at MV Drives as MarCom Project Manager for three years while studying Business Administration.

Mayerline enjoys the excitation systems business: "This new job is very interesting for me. Everything about MarCom is covered, from advertisements to customer events. Furthermore, it is exciting to work with various cultures from around the world.

"Generally I want to update all our marketing material and enhance the communication between us and all our stakeholders."



Mayerline Jimenez, MarCom Manager

From drives to excitation systems

Aija Mankkinen new Head of Excitation Systems talks to *UNITROL now* about her aspirations for the business.

Text Mayerline Jimenez

Photography Werner Zimmerli



Aija Mankinen started her ABB career in the medium voltage (MV) drives business in Finland. Following the centralization of MV drives, Aija moved from Finland to Switzerland, resulting in 16 successful years of experience in several job positions.

In April this year Aija took up a new challenge as Head of Excitation Systems.

UNITROL now: What is your first impression of the excitation systems business and the local organization?

Aija Mankinen: Very positive! Excitation systems is having a successful year and is the market leader. There is an impressive knowledge base, with some of the experienced team members having been with the division for more than 20 years.

The organization made me feel very welcome from my first day here. The atmosphere is extremely open and warm and this makes integration easy.

You worked within the MV drives business for several years and now you have moved to excitation systems. What are the main differences?

A first obvious difference is the size of the business. The global MV drives market is much larger than the excitation systems market and the ABB excitation business is only approximately a third of the ABB MV drives business.

Secondly, a large share of excitation systems goes to the retrofit market and needs more engineering to meet the specific needs of the customer. MV drives product portfolio is more standardized with pre-defined options providing the needed flexibility.

And on the operations side, the local engineering centers (LEC's) for excitation systems are more independent and flexible to adapt the products to local demands.

"From the product side, I particularly like the world class technology."

Having been in your new position for a few months now, what do you like about it?

It's a great pleasure to work with this global team. Every team member is very competent and helpful. They are really open to new ideas, even those people who have a long experience in their field. It is also good to see the respect that the team has for each other.

From the product side, I particularly like the world class technology. We are recognized as technical leaders in our field and have extremely high quality products. This is a good base on which to build our success.

What are your market expectations for excitation systems within the next 5 to 10 years?

I do not expect much growth in the new installations market within the coming years. Naturally, however, we can improve our market share. It is in the retrofit market that I see good potential for growth. Generally there will be increasing competition from low cost competitors.

In addition there will be opportunities for excitation systems outside the traditional power plant business, such as motor excitation or DC distribution application for example with green ship. We will have to keep our eyes open and seize these opportunities for additional business.

Where will you set the focus for further improvements?

There are three areas where we need to improve. First we should capture more business with generator OEM's. Furthermore we have more than 7,000 ABB excitation installations in the field, aging every day. With a proactive

sales approach and right channels to the retrofit and upgrade market we can increase our business. Finally we need to continuously improve our costs related to products and processes to stay competitive in the globalizing market.

In your new position you have to meet lots of expectations. What is necessary to fulfil this obligation?

To know what improvements are needed and where to set the focus you need to listen to the customers and try to understand the real market needs and competition situation and their trends. For doing this it is also very important to have an experienced team and their support.

How do you keep a healthy work-life balance?

I really like my job. But I also enjoy my leisure time. To do my job well it is important for me to also take the time to relax, do sports and for sure enjoy the beautiful Swiss mountains!

ABB Automation & Power World

ABB's three-day comprehensive users conference and exhibition showcases its extensive automation and power offerings and expertise under one roof.

Automation & Power World (APW) is ABB's largest customer event for automation, robotics, industrial power and utility power users. It targets engineering, operations, general management and executive management in a wide variety of industries. Organized workshops, as well as information exchange with ABB experts, industry experts and end users help attendees share best practices. In addition attendees learn how to reduce costs while improving their productivity and efficiency, be more competitive in today's challenging economic environment, and build the foundation for future growth and prosperity.

Beijing – Energy efficiency and renewable energy (May 10–12)

For the first time excitation products were presented at APW in Beijing. The local engineering center in China exhibited an UNITROL 6000 demonstration, the UNITROL 1000 series and SYNCHROTACT products.

In addition, ABB presented highlights of its new technologies such as the e-mobility electric charging, robot assembly, advanced automation control system and the solar house with an intelligent building system, wind power and solar inverter.

Zurich (June 07–08)

APW in Switzerland, held in a former ABB factory in Zurich, was a four-day exhibition that showcased ABB's extensive automation and power offerings and expertise. The event hosted customers, VIP's from politics, business and science as well as students and employees. The event was also attended by trade and business journalists.

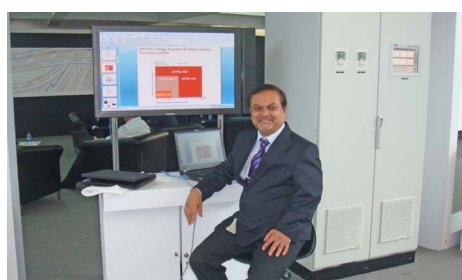
One highlight at the keynote address was the presentation of Otto Preiss, head of the local ABB power electronics and MV drives business, about "fast switch" power electronics as the key to the future of energy efficiency and renewables. The excitation systems were part of the

energy landscape, which represented all ABB products offered for various applications within the power industry.

New Delhi – Partnering to build a low carbon economy (September 19–21)

The first APW held in India received overwhelmingly positive feedback from customers, partners and ABB staff worldwide. With over 2,500 customers participating in the event over three days, APW turned out to be one of the biggest exhibition and conferences of its kind.

The excitation systems local engineering center received a very good response, with some 120 customers present at the excitation session. In the exhibition area the UNITROL 6080 dual channel AVR panel with ECT was displayed. Here, also, customer feedback was very positive particularly in terms of the products and quality.



Regional sales conference 2011

First class information exchange

Excitation systems sales responsible from South Korea, Japan, China, Singapore, Taiwan, Saudi Arabia, Indonesia, Thailand and Switzerland attended the regional sales conference. The 30 participants gathered at the ABB premises in Xian, the former capital of China, from 19 to 21 September. Aija Mankkinen, the new Head of Excitation Systems, also attended the conference.

The main topics under discussion included:

- Improving / updating product know-how
- Optimizing the bidding process
- Global sales coordination



The attendees had the opportunity to visit the excitation systems factory and view a real system demonstration.

The regional sales conference provided a better understanding of sales prac-

tices through various countries and was again an excellent platform for information exchange.

Global technical meeting 2011

Sharing knowledge and best practices



With 16 participants from 10 local engineering center (LEC) countries, the excitation systems global technical meeting was successfully conducted at ABB in Turgi, Switzerland from 10 to 12 October 2011.

The attendees received a detailed product update as well as information about various engineering tools and processes. Every LEC representative had the opportunity to share their best practices with the other teams and gather information on how to improve the knowledge exchange. In different kiosk sessions, some predefined technical topics were

demonstrated in real-time from the corresponding experts.

In order to complete the program the participants visited the excitation system factory and discussed all topics presented over the three days within the group.

Sharing knowledge and best practices is the key objective of the global technical meeting with the aim of improving processes and tools and to exchange strengths between all LEC's.

Upcoming Event

Power-Gen International, Las Vegas, Nevada, USA

December 13–15, 2011

[Click here for more information](#)



UNITROL® 1000 series. Compact and powerful, providing stable and reliable control.



ABB's latest automatic voltage regulators, UNITROL 1010 and UNITROL 1020, are designed for indirect excitation of generators and motors in marine, wind, oil & gas and land-based power plant applications. A built-in power system stabilizer and accurate simulation models contribute towards meeting the most demanding grid codes. The new UNITROL 1000 series is available from January 2012.

To find out more, visit www.abb.com/unitrol