

UNITROL now



Improving efficiency

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First pilot onboard DC grid
"Dina Star" undergoes sea trials with ABB's onboard DC grid.

UNITROL now 67|13



Aija Mankkinen
Head of Excitation Systems

Dear Reader,

Welcome to the latest issue of *UNITROL now*.

We strive to improve your efficiency with our innovations and continuous improvement of our products and systems. In this issue we start with efficiency at sea on page 04, describing the successful ABB onboard DC grid, which increases the vessels' energy efficiency by 20 percent. On page 10 you can read more about the excitation system which is integrated in the onboard DC grid. We present on page 08 the revamp project at Vester Hassing in Denmark, where our MEGATROL is used for compensators and extends their lifespan by 20 years. Finally you can read on page 12 about the dependability of synchronizing systems and how you can

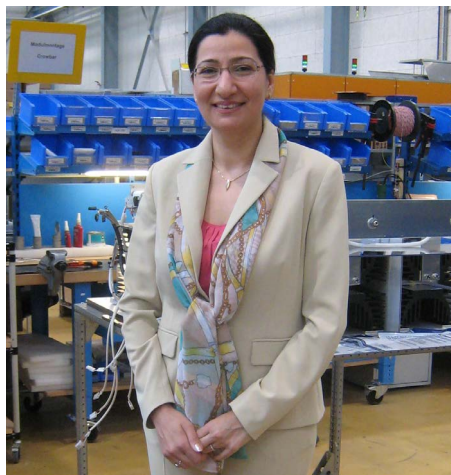
subsequently increase the availability of your plant.

Additionally there is a new chapter fully dedicated to our service team. The team aims to keep you up to date about the life-cycle management of your installed excitation systems and also better informed about our service portfolio.

I hope you enjoy reading this issue of *UNITROL now*.

Have a pleasant summer time.

Kind regards
Aija Mankkinen



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“Dina Star” is the first offshore supply ship to sail with ABB's onboard DC grid system.

Efficiency at sea

Text Tobias Keller

ABB has developed an onboard DC grid that can increase operating efficiency by up to 20 percent while requiring much less space. The first ship equipped with the grid was launched in February. The centerpiece of this system was developed and tested by ABB's Excitation Systems team.

Ships with high maneuverability and impulse adjustment requirements are not directly powered using the ship's engines. The reason is that the mechanical connection between the ship's engine and propeller would react too sluggishly. As such, they are equipped with electric variable-speed drives that control the speed and torque of electric motors.

In ships with these electric drive systems, speed-controlled drives account for more than 80 percent of the installed power. Each drive requires DC for the generation of the variable-frequency output voltage which is usually generated by an internal rectifier. ABB's new system centralizes these DC connections by distributing the electric energy - rectified centrally - via a single 1,000 volt (V) DC circuit.

This provides two advantages: Firstly, various devices, such as the drives' rectifiers, AC power switching stations and heavy transformers become obsolete. "The spatial requirements, as well as the weight of the electrical equipment, can be reduced by up to 30 percent each, in this way", explains Tobias Keller, Vice President, Excitation Products and Technology at ABB.

Secondly, the energy efficiency can be increased on board, mainly by adjusting the ship engine's revolutions. For AC operation a fixed number of revolutions is required. However, fuel consumption - measured in grams per kilowatt hour output - is only ideal in a very limited operating range. If less power is required, an engine

with a fixed number of revolutions works in a sub-optimal torque range. Depending on the use of the ship, fuel consumption, as well as emissions, can be reduced by up to 20 percent by adjusting the number of engine revolutions in the DC system.

Complete onboard DC grid system

These arguments convinced the management of the Norwegian shipping company Myklebusthaug. In the winter of 2012/13, a new offshore platform supply ship, Dina Star, was built in the Kleven shipyard in Ulsteinvik (Norway). ABB supplied a complete onboard DC grid system for this 93 meter long ship, including all required systems for power, drive and automation.

The Dina Star is equipped with a dynamic positioning (DP) system which holds the ship against the current and wind in a defined position with steel rudders and the main drive units. For safety reasons, the DP system is set up on a redundant basis, i.e. several engines run in parallel for the generators. The new ship has five diesel generators. In a traditional AC solution these engines work with a fixed number of revolutions. The new onboard power supply makes operations in the redundant split mode much more efficient because the number of engine revolutions can be adjusted to the required load and optimized.

This innovative onboard DC grid is a joint development by several ABB Product Units in Norway, Finland and Switzerland. The main power converter, UNL 14300, was

adapted for the specific area of use and is controlled by a UNITROL 6800 regulator*.

"This project shows what is possible at ABB when different units contribute their specific know-how and co-operate closely", Tobias Keller emphasizes. "The geographic distance was not a problem."

Tests at ABB in Switzerland

The components were assembled in the overall system and tested at the end of 2012 in Turgi, Switzerland. "Our test center has the required performance parameters", Olaf Voigt, Manager of the laboratory at ABB in Turgi, describes. "We implemented the experimental assembly for the tests in just four weeks. Usually, for a project of this magnitude, we expect a preparation time of about three months", Voigt adds. Two diesel engines with an output of about 1 MVA each were installed for the generators.

The successful pilot installation at Myklebusthaug is the beginning of opening up this new business segment.

*More information about this regulator on page 10.

UNITROL® 1010 used for a waste heat recovery system

Text Rudolf Moeckli

For the first time an UNITROL® 1010 automatic voltage regulator (AVR) has been installed in a waste heat recovery system on a marine application. About four percent of the full power output of this diesel engine is recovered thereby reducing prime energy consumption.

In a collaboration between ABB and MAN Diesel & Turbo, the first turbo compound system including power turbine and generator (TCS-PTG) for marine applications has been developed. ABB supplied the generator with the UNITROL 1010 used as the excitation system in a control cabinet for generator control including protection and synchronization. The complete system is assembled at MAN Diesel & Turbo in Augsburg, Germany, where final factory acceptance tests are being finalized.

The first system will be used for a large container vessel, build at Samjin Shipbuilding in Weihai, China. The prime mover is a two-stroke diesel engine with 27 MW output power. The TCS-PTG will recover 4 percent of the output power by directing the exhaust gas through a turbine. The 1 MW electrical output power is used mainly for cooling the containers. This means a stand-alone auxiliary gen-set can be switched off to save fuel.

MAN Diesel & Turbo and ABB see a growing potential on waste heat recovery systems due to global energy saving targets. The system today is optimized for two-stroke diesel engines and can be used for marine as well as land-based power plants, where upgrading of already installed engines can be easily done.

For this application, the UNITROL 1010 shows its strength due to the built-



TCS-PTG20 - the latest development of MAN Diesel & Turbo with an UNITROL 1010 in the control cabinet | 1 Generator | 2 Coupling | 3 Gear box | 4 Power turbine

in software functions, such as rotating diode monitoring, extended supervision and monitoring as well as automatic synchronization. This simplifies the control cubicle and reduces costs by shortening assembly and test times. At the same time the reliability is increased by using fewer components and a simplified system.

UNITROL 1010 and UNITROL 1020 feature marine class certificates by DNV. The German Lloyds certification is ongoing and should be obtained in autumn 2013.

The UNITROL 1000 product family has a long and proven history in marine applications. In addition, other land-based systems for waste heat recovery systems are booming, where UNITROL 1010 and UNITROL 1020 can show their strengths.

For further information please visit:
www.abb.com/unitrol



1 Salto Grande hydro power plant | 2 Commissioning group from ABB with engineers and technicians from Salto Grande | 3 Old excitation system from another supplier | 4 ABB UNITROL 5000 excitation system

ABB installs 14 excitation systems in Salto Grande hydro power plant

Text Alejandro Echave

On April 18th, ABB successfully installed 14 excitation systems, UNITROL® 5000, at the Salto Grande Hydro Power Plant, located between Argentina and Uruguay, over the Uruguay River. The project, which is now in commercial use, cost \$4 million, took seven years to complete and required the participation of ABB engineers from Argentina and Switzerland. The contract, according to the International Public Tender SG 393, was signed in February 2006, between the “Comisión Técnica Mixta Salto Grande”, ABB Switzerland and ABB Argentina. The plant was scheduled to be commissioned in stages, with two or three openings per year. The new excitation systems meet the requirements of

Argentina’s electrical grid regulations.

ABB in Switzerland manufactured and delivered 14 systems while ABB in Argentina is responsible for the project management, transportation, dismantling of all equipment, erection of new systems, local engineering and commissioning.

Alejandro Echave, Project Manager, says “At the end of April 2013, we commissioned the last unit, with “zero errors”, in mounting and operating of the systems, a good base for future collaboration with the power plant”.

Excitation systems experts from ABB facilities in Argentina, Switzerland, Germany, Brazil and Croatia participated during the project, with a local sub-contractor near the power plant. The cus-

tomers’ engineers and technicians from Argentina and Uruguay attended the factory acceptance test and training at ABB in Switzerland and undertook some commissioning tasks within the power plant.



Compensator station, Vester Hassing, Denmark

Synchronous compensator application using MEGATROL

Text Tobias Keller

The synchronous compensators at Vester Hassing in Denmark were recently revamped with an ABB MEGATROL Light to extend their life-span by 20 years.

Earlier this year, Germany was able to cover its total power consumption for the first time with renewables only. Of course, it was a weekend, it was sunny and there was wind. However, the trend can clearly be seen. It's just a matter of time before conditions are achieved during normal working days as well.

Rotating inertia

The renewables mentioned above are not increasing the rotating inertia in most of the cases. As an effect, the rotating inertia, able to support and stabilize the grid, is reduced. Other technologies have to be used to enable ride-through capabilities and to get fast and strong support during certain faults. For a long time, synchronous compensators have been widely used in conjunction with HVDC (High Voltage DC) links.

Synchronous compensator

A synchronous compensator is started as a synchronous motor typically with a static starting device. The static starting device is accelerating the synchronous machine to about 10 percent overspeed (oversynchronous speed),

before it is excited and later on synchronized while reaching its nominal speed. The starting, as well as the excitation function, can be completely covered by ABB's MEGATROL. As there is only a limited starting torque and no compressor required (as known from the gas turbine starts), the starting power is limited and typically in the range of MEGATROL Light (more details in the table below).

MEGATROL is the solution, not only to start gas turbines, but also to start synchronous compensators.

Vester Hassing, Denmark

ABB recently used a MEGATROL Light to revamp the synchronous compensator station Vester Hassing in Denmark. The Vester Hassing synchronous compensator station was built in 1965 together with the HVDC Konti-Skan 1, a HVDC line connecting Denmark and Sweden. Konti-Skan 1 allows a transfer of 250 MW at 250 kV. A life-cycle investigation in 2004 showed that the compensator itself is in very good condition and can be used for another 15 to 20 years. Therefore Energinet.dk decided

to revamp the excitation and the starter for this 100 MVar compensator. This revamp not only extends the life-span by 20 years, but also reduces the stress during startup and the starting time itself. Furthermore, it is possible to comply with all required grid codes and to support the grid whenever required.

MEGATROL



MEGATROL Light

MEGATROL is a smart and compact solution, combining UNITROL®6800 SES and MEGADRIE-LCI static frequency converter. The use of ABB's powerful AC 800PEC controller for both systems results in fewer costs for spare parts and training of maintenance staff. This is an attractive solution for gas turbine, synchronous compensator, combined cycle and pumped storage power plant applications.

MEGATROL configuration	Power	Medium	Light
Maximum output current	2,500 A	1,930 A	1,500 A
Maximum output voltage	5,600 V	1820 V	1,820 V
Rated converter power	15.5 MW	5.0 MW	2.0 MW
Maximum ambient temperature	45 °C (55 °C with derating)		
Protection class	IP31		

Ask our [experts](#) for more information or visit: www.abb.com/unitrol

Innovation

Integrated within ABB's onboard DC grid, the new adapted and designed UNITROL static excitation system helps vessels to achieve a 20 percent efficiency increase and reduces the electric equipment footprint and weight by up to 30 percent. The first pilot is now successfully tested and commissioned.

UNIREC

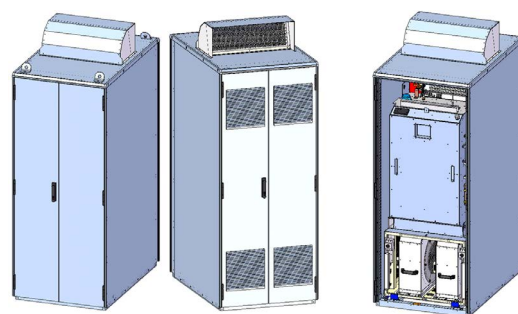
Combined UNITROL and rectifier system

An innovative concept – Onboard DC grid

ABB has created the most flexible marine power and propulsion system to date, with its onboard DC grid for electric power distribution. The system merges the various DC links throughout the vessel and distributes power through a single 1,000 VDC circuit, thereby eliminating the need for main AC switchboards, distributed rectifiers and converter transformers. The onboard DC grid combines the best of AC and DC components and systems, is fully compliant with rules and regulations for selectivity and equipment protection, can be used for any electrical marine application up to 20 MW, and operates at a nominal voltage of 1,000 VDC.

Excitation systems in the onboard DC grid – UNIREC

This innovative onboard DC grid is a joint development by several ABB Product Units. The main power converter was adapted for this specific area of use and is controlled by a static excitation system. This combination, called UNIREC, includes two functions: the excitation of the main generator with a UNITROL 6080 static excitation system and a main rectifier, UNL14300 or UNL13300 thyristor converter, to supply the DC bus.



Advantages

- Reduction of spatial requirements and weight of the electrical equipment
- More flexible positioning of electric components
- Increase of energy efficiency on board
- Less cabling and cabling connections, by means of reduced number of components and use of bus ducts

News

> 13,000

More than 13,000 UNITROL 1000 automatic voltage regulators (AVR) have been successfully installed worldwide. UNITROL 1000, ABB's high reliable AVR, has the widest range of integrated software functions and facilitates the commissioning and troubleshooting with the commissioning and maintenance tool CMT1000. These and much more benefits have been the driver for many customers in deciding to control their generator with an UNITROL 1000 AVR.

UNIsmart

Easy configuration for the UNITROL® 6000 system with the new product configurator solution – UNIsmart (details published in the 65th issue of this magazine). The development for the first release of UNIsmart has been finalized. The roll-out for Switzerland has now started. Extensions of functionality and further countries for future roll-outs are now in the planning phase.

CSEE

The Chinese Society for Electrical Engineering (CSEE) held its excitation seminar in Shanghai this year. The event was hosted by ABB in China. Tobias Keller, Vice President Products and Technology Excitation Systems, was invited as guest speaker. ABB presented PSS 4B and the UNITROL 6000 performance during this seminar.

Power system stabilizer improves generator performance

Text Wolfgang Knapp

Power system stabilizer (PSS) is an excitation add-on dedicated to reduce low frequency oscillations of the generator's rotor angle.

Every generator shaft has its own oscillation profile depending on its electromechanical parameters and grid reactance. Connection to weak grids or long AC transmission lines are typically where oscillation amplitudes may limit generator power or even risk loss of synchronization – without a properly tuned and performing PSS.

ABB's UNITROL® 6000 excitation systems come with highly sensitive and accurate PSS included in their control platform. Throughout the world many power plants in critical grid locations are able to boost productivity with UNITROL 6000 PSS performance.

Stand-alone PSS solutions

Global grid code requirements are not only influencing new power plants, but also existing excitation systems. To comply with the grid code requirements, ABB offers stand-alone PSS solutions. These can be added to any excitation system and significantly enhance its performance.

Increasing demand for upgrade solutions has triggered development of the UNITROL 6000 stand-alone PSS. As a result, ABB is launching a compact DIN-rail mountable unit which includes all required analog and digital inputs and outputs for seamless integration to almost any excitation system. It offers the same features and performance as the integrated UNITROL 6000 PSS. This includes single band PSS (IEEE-

type 2A/2B) to suppress one oscillation frequency and multiband PSS 4B to suppress three local or inter-area oscillations at the same time. In both cases the "adaptive PSS" option can automatically adjust the amount of damping to the actual grid situation.

Scope of supply

UNITROL 6000 stand-alone PSS comes with a complete set of tools and functions to facilitate PSS tuning, grid compliance testing, maintenance and trouble shooting. Parameterizing, step- and white noise analysis function, event logger, high speed data recorder and other functions can be managed by a single Windows software tool that communicates with the PSS unit via Ethernet.

UNITROL 6000 stand-alone PSS will be released end of this year after passing all ongoing verifications. In the meantime UNITROL 5000 stand-alone PSS is available.

Diversity of dual channel systems

Text Werner Zimmerli

Faulty synchronizing can cause severe damage to generator shafts or end windings. The use of SYNCHROTACT 5 dual channel devices can help alleviate such problems.

With a faulty synchronizing, the paralleling command is given by accident, i.e., the circuit breaker (CB) is closed regardless of the paralleling conditions.

In order to close a CB, the following conditions must be fulfilled:

- Voltage, frequency and phase angle differences within tolerance
- Rotating field of both voltages in the same direction

The rotating field has only to be checked during commissioning, or after new connection of the measuring circuits.

Generator voltage and generator frequency move slowly during synchronizing and are therefore rarely the reason for faulty synchronizing.

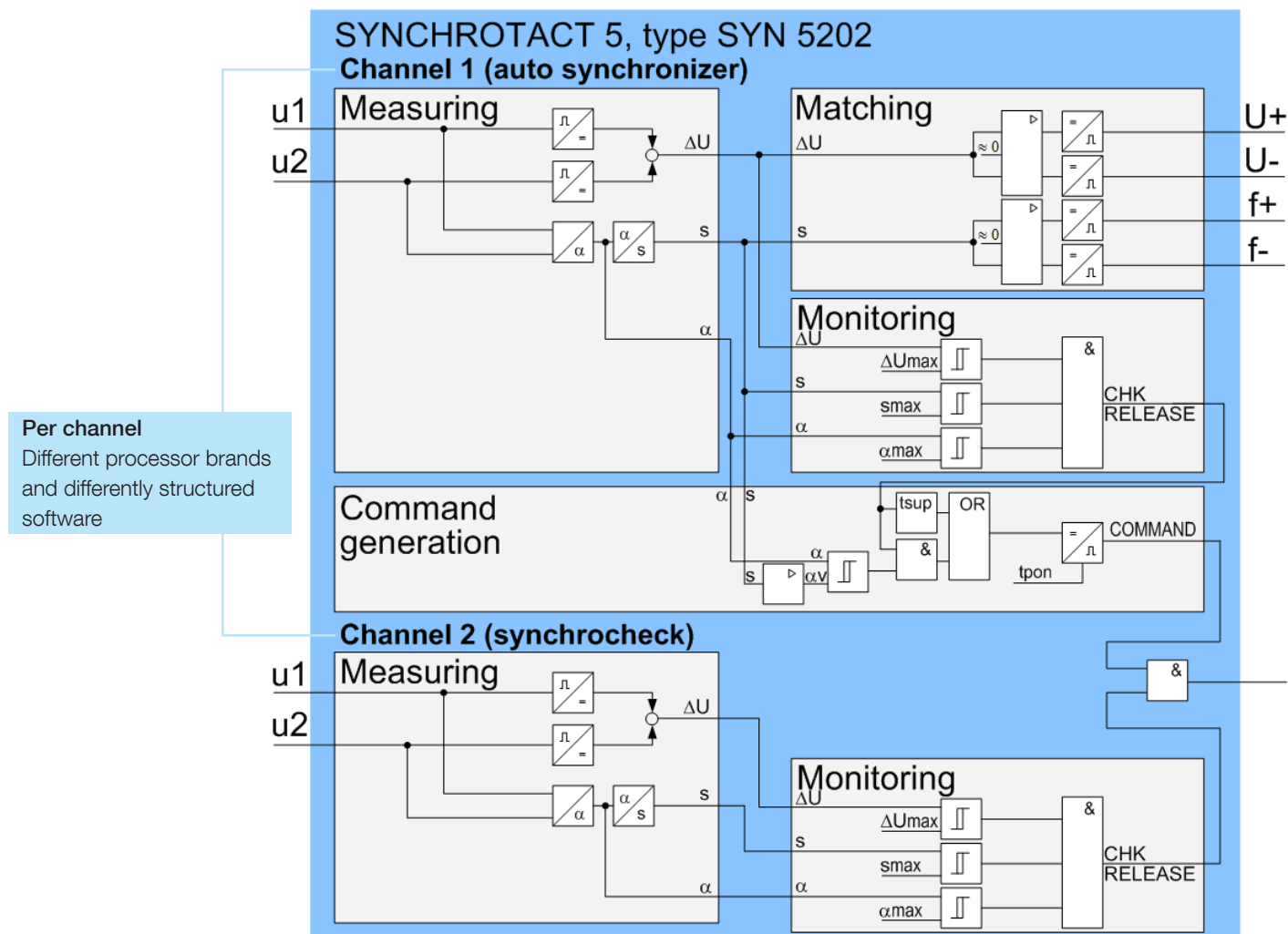
The phase angle difference, however, is

moving relatively fast through the admissible angle window. With existing technology, meeting this window is not a problem, but with faulty synchronizing, the probability for the angle to be outside of the admissible window is high.

The consequences of faulty synchronizing are of such an importance that such a failure may not be tolerated. For this reason special measures should be taken in order to improve the safety of the plant.

Improvement of safety against faulty synchronizing with diverse dual channel device (DDC)

SYNCHROTACT 5 dual channel devices use two independent channels that are working in parallel, but with its output contacts in series. While channel 1



works as an auto synchronizer, carrying out all the necessary functions, channel 2's function is to prevent faulty synchronizing taking place in case of a failure in channel 1.

This improves safety considerably compared to single channel devices. It is very unlikely that sudden failures appear in both channels at the same time.

In addition, the two channels of SYNCHROTACT 5 dual channel devices are composed of two diverse channels, different processor brands and differently structured software. This improves safety against systematic failures (common mode failures), e.g., software errors, or design errors.

The two channels are two different „products“ in a common casing. Compared to two separated synchronizers

from different manufacturers, this reduces the cost for engineering and assembly and ensures compatibility regarding functionality and setting philosophy.

For further information please visit:
www.abb.com/synchrotact

Example

On the link below you will find a presentation with images of an explosion at a power plant due to faulty synchronizing.

[Steam Forum](#)





Stronger local presence

Text Mayerline Jimenez

ABB's Excitation Systems has opened a local engineering and training center in Dubai. It will mainly serve customers in the Gulf region offering complete services and support.

There are worldwide eleven additional local engineering centers (LEC) for ABB's excitation systems, located in Australia, Austria, Brazil, Canada, Finland, India, Italy, P.R. of China, Spain, South Africa and Switzerland. The LECs support local customers within the complete value chain, from sales, engineering, supply, project management, testing, commissioning, training to service and support. All centers have a pool of knowledge and resources to deliver the best solution to local customers.

In March 2013 a new local engineering and training center was opened in Dubai. The aim was to minimize the distance to customers in the Gulf region and offer the most customer-oriented services from the sales phase throughout the whole life cycle of automatic voltage regulators (AVR).

The LEC starts with an established team of local engineers, sales and project

managers, who have vast skills and experience in excitation systems and their field of responsibility. The team offers its services for all ABB AVR, UNITROL 1010, UNITROL 1020 and UNITROL 6080.

"We are proud to have been awarded this mandate and are looking forward to delivering superior service to our customers," says Soman Ukkath, Local Business Unit Manager, Dubai "This will provide our Gulf region customers an exciting incentive with the possibility to source the excitation systems from a local unit."

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"This is an important step forward to strengthen our local presence and enhance our entire value chain", explains Aija Mankinen, Head of Excitation Systems.



Aghnes Rizkallah Greuter
Head of Global Operation,
Excitation Systems

New captain for the Global Operation team

Text Mayerline Jimenez

On April 1st, 2013, Aghnes Rizkallah Greuter, was appointed Head of Global Operation for the Global Product Line Excitation Systems. Here she discusses her plans for the future.

What is your background, how long have you been with ABB and what is your business philosophy?

Originally I am from Lebanon and have lived in Switzerland since 1994, my second home. I am married and have two children - my pride and happiness.

I have a Master's degree in Biomedical Engineering as well as in Control Systems. Since 1997 I have been working for ABB, most recently as Product Manager for the ACS 1000 medium voltage (MV) drive. Prior to that I worked in the MV Drive's R&D team as a software development engineer and team leader.

ABB is an institution. I live in Baden, Switzerland and the city is full of BBC/ABB fingerprints which I take great pride in explaining to my children.

I appreciate the integrity and innovative spirit we have at ABB. We have lots of opportunities to grow professionally and personally in our company. To me ABB is like a second family. I have the chance to grow, develop my skills.

My business philosophy is simple: Listen, learn, question and improve.

What is your proudest achievement at ABB – something you would be pleased to call your legacy?

There is much that I'm proud of – it comes from the small things, from finding a bug in a software to motivating a team member. It's not important for me to highlight a personal achievement as I believe strongly in team work. A specific 'team' legacy, worth mentioning, is the reboost of the ACS 1000 (medium voltage drives) business, maintaining a profitable production in Switzerland together with my previous team and all other teams involved.

How would you describe the area you are responsible for (Global Operation) and its importance to ABB's excitation system business?

We have the global operations responsibility and one of the challenges is to understand the market and coordinate global needs. Therefore it is important to keep a very close cooperation with our product management and development teams.

The global operation team is the interface between the global excitation systems team in Switzerland and the local engineering centers (LEC). We assist our LECs by providing them the technical and operational support they need to

Global Operation - Excitation Systems

- Evaluation of new local engineering centers (LEC) and authorized value providers
- Rules definition for cooperation with distributors, channel partners, OEMs, EPCs, system integrators
- Coordination of:
 - Worldwide sales
 - Collaboration with business partners
- Technical and commercial support for LECs/VARs
- Products / components order handling

serve their local market. Our team takes care of an efficient ordering process and on-time delivery to serve our customers in the best way.

All the above guarantees continuity for the ongoing business globally. With dedicated sales, market and technical skills, we develop further OEM relations for UNITROL and drive the excitation business to grow.

In your position as Global Operation Manager you have to meet lots of expectations. What is necessary to fulfill this obligation?

The global team spirit is a must, combined with a suitable structure and the right skills.

Then comes operational excellence (efficient processes) – to have a successful global business it is important to set the right priorities and to set the strategies to reach the goals. For this you need to understand the market, competitors situation, customer needs and yet have the best setup to be successful.

Finally, we need to build on our strengths and know-how, determine the changes and have the courage to improve things.

What are your goals this year, and what strategies have you developed to meet your goals?

For this year, I have set myself the following goals:

1. Maintain the business and its performance.
2. Keep the team motivated, all working towards the same goals.
3. Build on the good existing base and know-how.
4. Understand the excitation market, its requirements and our customers behavior, as a base for business

strategies and actions.

It is too early to talk about my strategies. For now I need to learn more about the excitation business and pursue a good working cooperation locally and globally.

What, in your opinion, are our key strengths within the global power market?

ABB excitation systems are technology leaders in the power market, have a big reference and installed base. In addition, we can offer packages and comply with different standards.

Another key strength is that our people have many years of experience in different jobs, throughout the excitation business. I have lots of respect for the ones who have worked in several groups within excitation systems. They are full of valuable experience and know-how, which is fundamental for the entire team.

Where do you see Excitation Systems, four years from now?

This is a challenging question.

A lot of work and projects are ongoing to explore new areas and penetrate different segments, such as marine, traction and wind. I would expect – and it is my goal – to push further in these segments, especially with UNITROL 1000. The sky is the limit!



Life-cycle communications (p)review

Text Marc-Julian Herrmann, Natalie Delucca

Ensuring that our customers know the latest life-cycle status of their systems and products while providing the best service strategy is critical to the success of Excitation Systems service.

UNITROL® M and SYNCHROTECT® 3 campaign review

Our product life-cycle management concept, as part of our pro-active communication, guarantees our customers any life-cycle changes to secure the assets of their systems.

Almost 15 years after the end of mass production and as part of the life-cycle concept, the service excitation team rolled-out a global UNITROL M and SYNCHROTECT 3 campaign during March to December last year. The main goal of this campaign was to inform all end-customers about the upcoming life-cycle change and the most valuable solutions to ensure product reliability and optimum performance for a dependable operation by end of 2013.

Around 800 UNITROL M systems, which were installed in the early 90s, are spread across the world. All these customers have been informed by an exclusive created communication package including the life-cycle information and its recommendations such as:

- Performance review programs, backed-up by spare part management
- Control upgrades, which involve upgrading the UNITROL M control platform to an active platform while keeping the legacy power converters
- Retrofit solutions, which include a complete replacement of the excitation system with one of the active systems UNITROL 1010, UNITROL 1020 or UNITROL 6080

Through this campaign customers have been made aware of how to increase the reliability of their assets of

all elements suffering from aging effects and finding the best suitable solution from a strategic viewpoint.

Consistently positive feedback from end customers sites regarding our pro-active life-cycle communication and high customer satisfaction was the major outcome of this campaign.

Preview UNITROL® P campaign

Based on the positive and successful results of the UNITROL M campaign, the service excitation team is working on preparations for the next life-cycle note for UNITROL P.

UNITROL P voltage regulators are widely used around the world and will pass into the obsolete phase by end of 2015.

In order to keep our customers informed, we will launch, as part of the

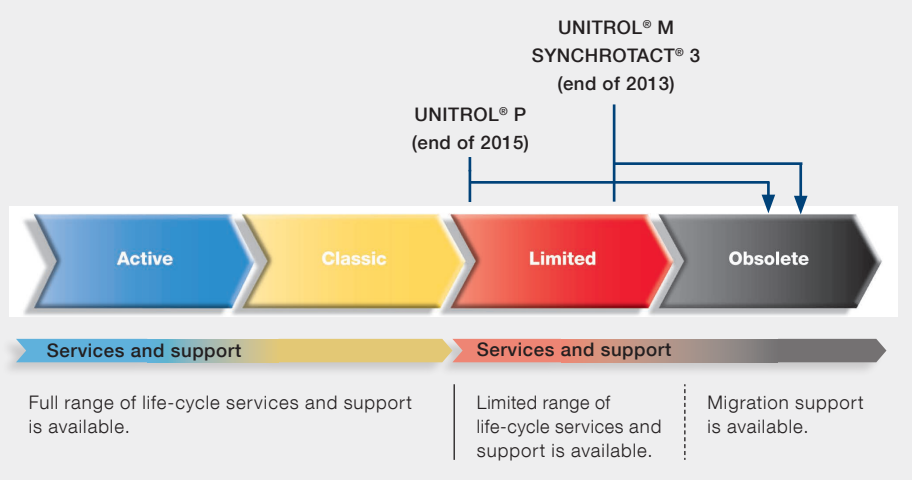
UNITROL P campaign, a first life-cycle announcement this year. Owners will be informed about the actual status and the upcoming shift into the obsolete phase. In a next step there will be a second roll-out of proactive information. A complete life-cycle communication package including specific life-cycle information, service offering proposals and contacts will be distributed at the beginning of 2014.

During this time our customers can contact ABB in order to discuss further options to optimize their asset.

One of the key targets is to keep all our end-customers using UNITROL P systems updated, thereby making it possible to inform in advance about the most economical and reliable solution.

[ABB Power Electronics Service - online](#)

Life-cycle status



UNITROL® 6080 ensures safe and reliable operation for Eggborough's power station

Text Mark Garside

ABB will supply a dual channel UNITROL 6080 automatic voltage regulator (AVR) for Eggborough Power Limited's coal-fired power station in Goole, East Yorkshire, UK.

Eggborough Power Station provides around 2,000 MW for the national grid, enough to power around two million homes. The coal-fired plant first came on line in 1967 and became an independent business in 2010. From the 1990s to the present day, a number of upgrades have been undertaken to improve environmental performance and to replace major components with more efficient, modern designs. This includes the upgrading of the power station's AVRs.

ABB's technical expertise and extensive experience in retrofitting excitation systems was the key factor in securing this upgrade. ABB is manufacturing a complete replacement for the existing AVR equipment, based on its UNITROL

6080 AVRs with dual auto channels and dual power converters replacing one of the existing single channel AVR units, whilst retaining the rotating exciters.

The UNITROL 6080 AVR is one of the latest developments in ABB's highly successful line of UNITROL excitation systems. The UNITROL 6080 is based on the AC 800PEC high performance processor family, which is an extension of ABB's 800xA control platform, developed to meet the fast control requirements of power electronics. It meets current grid code requirements whilst the dual-channel configuration of the UNITROL 6080 significantly improves the reliability of the plant. The excitation control terminal and the Ethernet connection with OPC protocol are further options that allow simplified operation, monitoring and maintenance of this excitation system.

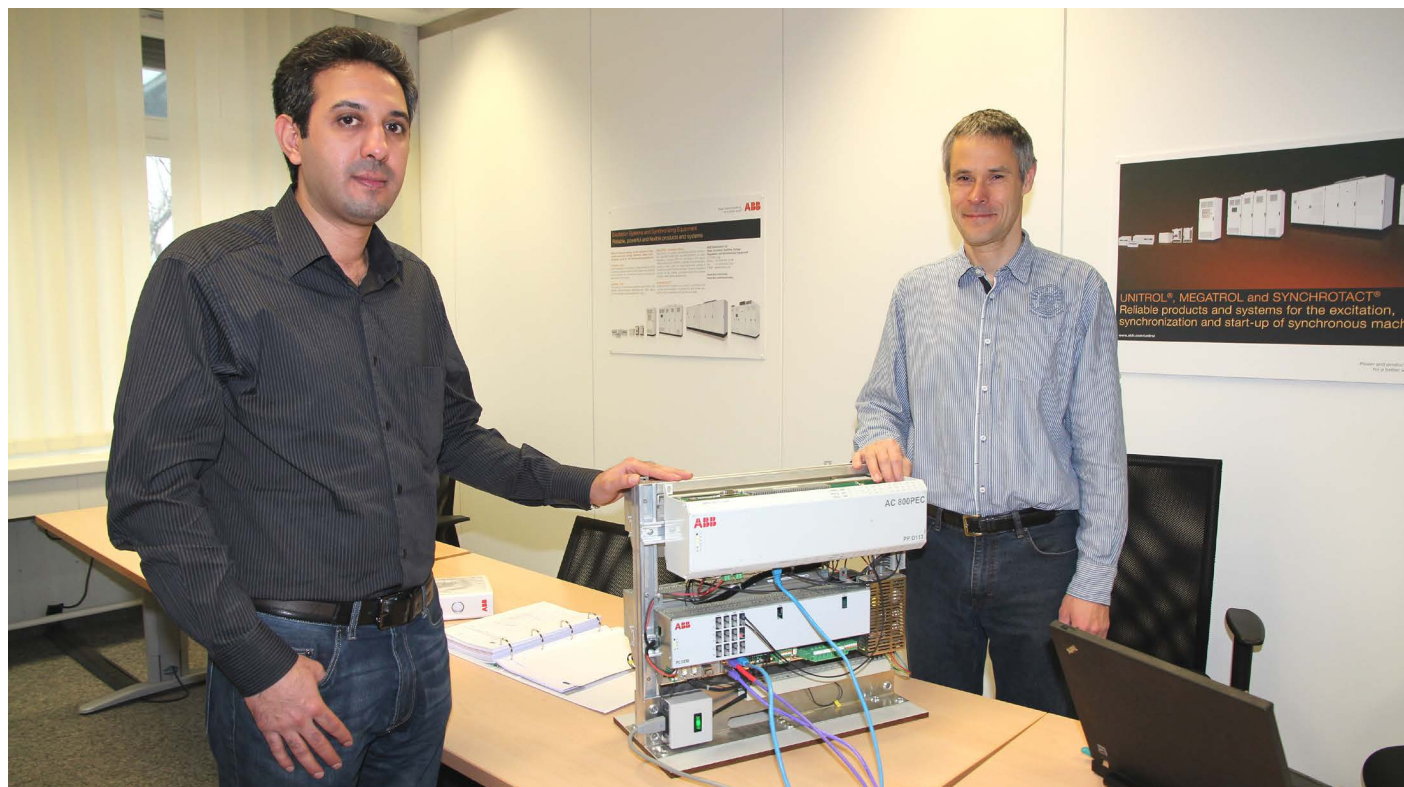
ABB's project team and Eggborough Power's station staff will work closely

together to design the new equipment, including interfacing with the existing station systems.

"We are delighted to be working with Eggborough Power to maintain and improve the reliability of this important power station by implementing ABB's retrofit AVR solution," says Mark Garside, ABB's Operations Manager for Power Generation Excitation Systems in the UK. "This is the latest in a number of contract successes that confirms that UNITROL is the excitation solution of choice in the UK for retrofit projects, particularly for its advanced technology."

For further information please visit:
www.abb.com/unitrol





Othman M. Al-Essa (left) with one of his instructors, Roland Richner (right), at ABB's Learning Center in Turgi, Switzerland

Three months short-term assignment for Saudi Aramco engineer

Text Stefania Saredi

Our learning center is very glad to have successfully completed a three months short-term assignment for Othman M. Al-Essa from Saudi Aramco.

The objective of this tailored training program at ABB's learning center in Turgi, Switzerland was to enhance his knowledge and experience in the field of excitation systems, maintenance and performance optimization based on the installed UNITROL base of Saudi Aramco.

The program included tutoring, personal coaching and hands-on training using demo equipment with generator simulators covering the following excitation systems – UNITROL F, UNITROL 6080 and UNITROL 6800.

The assignment was very successful to both our customer, Saudi Aramco, and the ABB University team. We are very pleased to have had the opportunity to train Mr. Othman M. Al-Essa from

Saudi Aramco. It has been a real pleasure having him in our team during three months and we would like to thank him for his contribution to this assignment.

Feedback of Othman M. Al-Essa, Saudi Aramco

"Excitation system was a new field for me. In these three months I have gathered a lot of good information, built a very good knowledge about these ABB systems, which I can differentiate now. It will, for sure, help me in my work and also my company, Saudi Aramco. I am able to advise which would be the most suitable excitation system for our facility and processes.

I absolutely recommend the short-term assignment. It is really professional and very good to send people to get new knowledge directly at ABB's learning center. It was remarkable to experience

this working style and to get to know the wonderful and great team.

I would like to express my gratitude and appreciation to all ABB learning center members in Turgi for all the peerless care and attention I have been given throughout the training period.

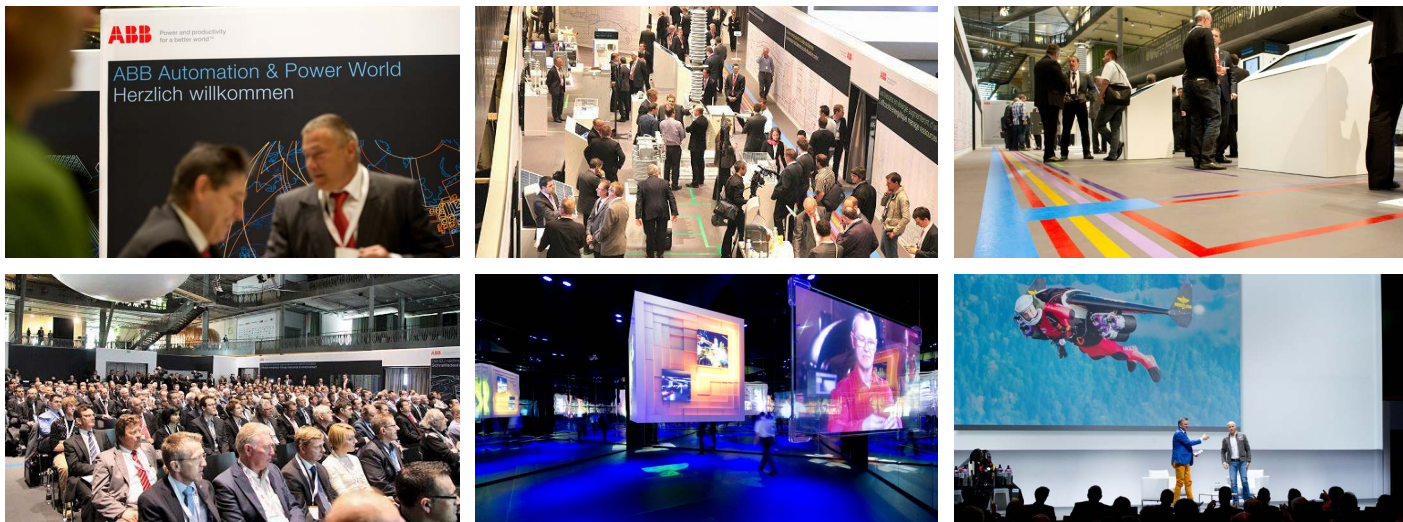
I feel that by knowing them and being a friend of them has really added value to my life."

For customized training courses, please contact:

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www.abb.com/abbuniversity



Impressions of the ABB Automation and Power World in the 'UmweltArena' Spreitenbach, Switzerland

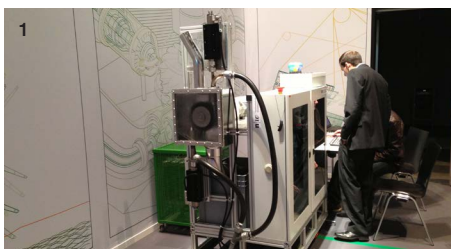
ABB Automation and Power World in Switzerland

This year's Swiss Automation & Power World (APW) took place on April 22-26. The event addressed customers, students and employees as well as VIPs from politics, business and science, and showcased ABB's extensive automation and power offerings and expertise. Highlights were the two customer days with presentations and information networking with ABB experts as well as the VIP event 'Talents – Trends – Technology' on the topic 'Energy Transition - Vision or Illusion?'.

Excitation Systems at APW

ABB Excitation Systems showcased a hydro power plant model (see image no. 1) in collaboration with the University of Applied Sciences and Arts Northwestern Switzerland FHNW. The model with an UNITROL 1020 AVR is used at the University for practical exercises and studies of the electrical engineering and information technology, as well as energy and environment students.

At the APW, the hydro power plant model was appealing for many visitors and built the bridge for interesting contacts and discussions around ABB's excitation systems. Tobias Keller, Vice President Products and Technology, Excitation Systems, presented the topic 'Grid sta-



bility - The today's challenge for power plants', giving the audience an overview on regulations and general technical features to be considered in future. This was followed by discussions with some customers, who wanted to know more about this topic.

The APW was a great opportunity to meet with Swiss customers and to show them ABB's innovations and benefits.

More information and all presentations held at the Swiss APW on www.abb.ch/apw

- 01 Model of a hydro power plant (HPP), with the AVR UNITROL 1020
- 02/03 Interesting and exciting customer discussions about the HPP model and excitation systems
- 04/05 Tobias Keller presenting the coming challenges related to grid stability for power plants to more than 80 customers

Excitation systems Down Under

Australia. ABB's local engineering center (LEC) in Australia invited its customers to visit the ABB premises in Melbourne or Brisbane to attend an excitation seminar at the end of June. The seminar was held in two locations for customers convenience. 30 persons seized the chance and attended the half-day seminar. The main speaker, Matthias Baechle from Switzerland, presented the advancements in excitation system controls, focusing on power system stabilizer control and its influence on grid code compliance. Furthermore, the functions of an excitation system were covered and an overview of ABB's life-cycle management was given. Matthias Baechle was also available to respond to any technical questions. Customers and ABB's expectations were met during this highly interactive and indepth technical seminar.



Left: Seminar in Melbourne, participants listening to ABB solutions in optimizing the power system stabilizer damping. Right: EEA in Auckland, New Zealand, interesting discussions between customers and ABB experts.



New Zealand. From 19-21 June, 2013 the EEA (Electricity Engineers' Association) Conference took place in Auckland, New Zealand. ABB showcased its extensive portfolio for the region and presented some papers at the conference. On 20 June, Matthias Baechle, ABB Excitation

Systems, presented the paper 'Improving the Transient Rotor Angle Stability by the Delayed Field Forcing' at the conference. This year's theme was 'Electricity, Past & Future' providing an opportunity to reflect on the impact electricity has had on society; where power engineering and technology stands and where it is going

in the future. The EEA conference participants were able to hear local and overseas industry leaders; attend the extensive exhibition and listen and participate to a range of technical and engineering papers and discussion forums.

Introducing AVR in China

Suzhou City, China. An UNITROL 1000 automatic voltage regulator (AVR) customer seminar was held on May 30 - 31, targeted to introduce the latest products. There were more than 50 participants from different Chinese companies, in relation with ABB as distributors, OEM customers, system integrators and end users. The UNITROL 1000 Product Manager, Rudolf Moeckli, introduced the global excitation system market view and presented the function description and new software of the latest products, UNITROL 1010 and UNITROL 1020. All participants were able to ask technical questions and follow interesting discussions with the ABB experts.



All customers and ABB excitation system experts at the UNITROL 1000 seminar held in Suzhou City, China.

Upcoming Events

2013 IEEE Power & Energy Society General Meeting

The theme of the meeting is: Shaping the Future Energy Industry
Vancouver, Canada
21 - 25 July, 2013

Hydro Vision International

Exhibition & Conference
Denver, Colorado, USA
23 - 26 July, 2013

Power-Gen International

Exhibition & Conference
Orlando, Florida, USA
12 - 14 November, 2013



Are you synchronized with IEC 61850?

Absolutely.



Automatic synchronization of generators and power lines, making use of the IEC 61850 communication protocol, is now possible with ABB's SYNCHROTECT® 5. In any power station, generators must be paralleled with power lines while in substations, two synchronous lines have to be paralleled. By implementing IEC 61850 protocol handling within an additional processor, the impeccable reliability and superb performance of the synchronizer remains unchanged. SYNCHROTECT® 5 is the right choice for safe and efficient synchronization. To find out more, visit www.abb.com/synchrotact