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# insider

A customer magazine  
of the ABB Group  
New Zealand



## Powering the future

### **Environmentally friendly – 06**

ABB's shore-to-ship power solution helps Stena Line to reduce environmental impact

### **Wind power – 10**

PCS100 and PCS 6000 powering the industry

### **Flawless cabling – 14**

PCS100 UPS-I caters for the power protection needs of a world-class factory

### **International news – 18-21**

Hannover Messe 2012 and PCS100 international news

Power and productivity  
for a better world™



Powering industries for future insurance  
of critical assests.



3|12  
Insider**Olivier Suter**

General Manager of MV Power Converter Systems (DMPE)

Starting with the Insider's last edition we expanded this magazine from a communication platform for low voltage power converters to a wider scope covering the entire power converters business.

We will continue to do so and promote our medium voltage converters PCS 6000 and PCS 8000 alongside their smaller brother PCS100. I am glad that our low voltage colleagues have done the important groundwork and that we now get the opportunity to join this established magazine with medium voltage.

During the last five years, we have made tremendous progress in integrating both our low voltage and medium voltage platforms into a common product portfolio ranging from single converter units of a few 100 kVA to large turnkey systems up to 100 MVA and above.

During this integration process we have benefited from each other's strengths. For example, the flexible and modular design of the PCS100 has served as a benchmark for productizing and modularizing the PCS 6000, which was originally developed to serve large systems such as railway interties. This gives us a more flexible and more efficient medium voltage platform and greatly improves our competitiveness in markets such as wind converters or shore to ship power supplies. In return, the PCS100 has benefited greatly from the application know-how and market access of the PCS 6000 in the Statcom business.

Integration of the two platforms on a product and application level is not the only thing we are working on. With a well-aligned product portfolio in place, the focus is now more and

more shifting towards a common marketing and sales approach. Expanding the Insider magazine to cover medium voltage is only one step in this direction. Common product and service training courses are another, such as those organized for South East Asia and the Middle East in June and July. Strong local and regional competence is a major success factor and competitive advantage of ABB.

What applies to the company as a whole is of equal importance to power converters business in particular. Building up more local competence besides our main centres in Napier and Turgi will ultimately help to grow the business globally.

ABB's success in North America over the last couple of years has shown what can be achieved with increased local competence. Europe, Australia, China and North and South East Asia are also making good progress and our teams in those regions are getting stronger by the day.

Personally, I have greatly enjoyed the journey of the last few years and I see a great future ahead of us. The world needs more and more sophisticated and flexible power converter platforms such as the ones we can offer from ABB.

I would like to thank everyone who has contributed to getting ABB's power converter business to where it is today. Special thanks go to all our customers who rely on ABB products and services and put their trust in us. Enjoy this magazine!





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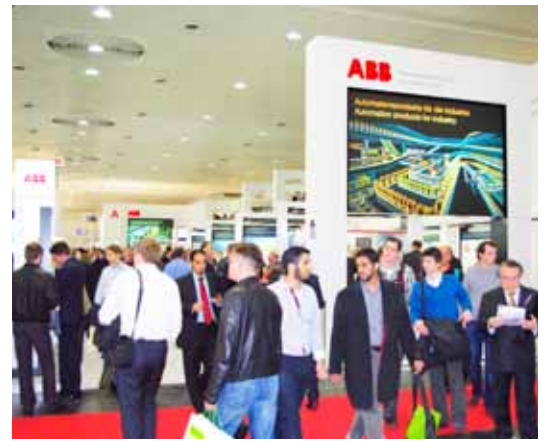
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Hannover Messe 2012

ABB's power converters on tour

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PCS100 UPS-I

Making an impact in leading edge manufacturing



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Providing the missing link between technically incompatible networks?

Certainly.



Power and productivity for a better world™ **ABB**

ABB plays a significant part in the expansion of renewable energy generation by allowing the interconnection of otherwise incompatible power grids. The state-of-the-art technology offered by PCS 6000 STATCOM solution has been successfully employed in a wide range of applications, including wind farms, heavy industries as well as utilities.

[www.abb.com/powerelectronics](http://www.abb.com/powerelectronics)

ABB Switzerland Ltd  
Phone +41 58 589 32 35  
Fax +41 58 589 20 90  
E-mail: [pes@ch.abb.com](mailto:pes@ch.abb.com)





Stena Hollandica ferry terminal

# Environmentally savvy

Turnkey shore-to-ship power connection at Stena Line B.V. ferry terminal in Hoek van Holland, the Netherlands.

ABB's shore-to-ship power solution helps Stena Line to reduce environmental impact and save money by cutting down fuel consumption. The turnkey project is the world's largest shore-to-ship power installation using frequency converters.





Ferries play a vital role in the public transport infrastructure of many waterside towns and cities. Vessels remaining in port for six hours on average need electricity to run amenities such as heating, ventilation, cooling and galley equipment.

Typically, this electricity is produced by on-board diesel generators which produce constant noise, noxious emissions and the accompanying unpleasant smell. The inhabitants of Hoek van Holland, a district of Rotterdam, are all familiar with the somewhat adverse influence of the ferry terminal, especially as there is no buffer zone between the local community and the port.

Fortunately, the operator of the terminal, Stena Line B.V., a subsidiary of Stena AB, one of the world's largest ferry companies, has taken steps to mitigate this negative impact. As part of the plan to cut down the fuel consumption of their fleet, Stena Line decided to invest in the complete elec-

trical infrastructure needed to simultaneously power two vessels from the local grid while berthed in the port of Hoek van Holland. ABB's shore-to-ship power solution could not have been a better choice.

#### Solution

To support Stena Line in their ambitious plan, ABB offered a complete package based on the PCS 6000 Static Frequency Converter of 6 MVA. ABB was responsible for the turnkey project, including the design, engineering, project management, installation and commissioning. The proposed solution was the outcome of a comprehensive study of the existing operation as well as on-board protection, to ensure the highest reliability of the system.

Onshore, ABB has supplied the converter substation, as well as all related civil works and cable management systems, and user interface and control systems to connect the different types of ships to the port's electricity grid. The solution utilizes the PCS 6000 SFC Static Frequency Con-

verter, a member of the proven PCS 6000 power converter product family, successfully operating in various applications.

On board the ships, ABB was responsible for the engineering, system integration, equipment delivery, installation and commissioning of the shore connection system. The modifications have been executed on two ROPAX (roll-on/roll-off passenger) vessels, "The Stena Hollandica" and "The Stena Britannica," as well as on two RORO (roll-on/roll-off) vessels, "The Stena Transporter" and "The Stena Transit."

As a full-scope supplier, ABB provided the complete solution which included not only the onshore and onboard installations, but also offered the technical know-how and invaluable professional experience of shore-to-ship power installations, frequency converters, system design and project execution. In addition, ABB delivered the complete turnkey solution within a relatively short time.

# Shore-to-ship power helps terminal operators to comply with environmental regulations while improving air quality and noise in ports.



Converter station

With the purchase order received in July 2011, the solution was shipped out in December 2011 and its operation started in June 2012.

## Low operational impact

From an operational point of view, the system is easy to handle. After plugging in the 11 kV cable, the complete operation of the system takes place from the engine control room onboard the ship. Via the power management system onboard or by manual control, the ship auxiliary generator is synchronized against the local grid, generated from the frequency converter. After the synchronization, the load is transferred to the shore side installation and the onboard auxiliary generators are automatically switched off.

The ship's connection to the harbor is fully automated, which means there is no assistance required from shore personnel. The process is completely seamless, without any interruption of the power onboard. After the power plug is in place, fulfilling technical and safety regulations, the converter goes into action, charging the power components and feeding the loads onboard almost instantaneously.

Stena Line says: "We are very satisfied with the professional co-operation with ABB during the project and the way the Onshore Power Supply System is working now."

## Shore-to-ship power

The continued expansion of global trade has drawn the attention of several regulatory parties including IMO/MARPOL and EU to the problem of pollution caused by ships. Tough environmental legislation has been issued, forcing the shipping industry to look for ways to reduce this negative impact.



Connecting Stena Hollandica to the local grid

As a response to increasing environmental regulations in the marine industry, ABB's fully integrated system helps to reduce emissions in ports by connecting ships to the port's electricity grid via shore-to-ship power connection. This secures a seamless automated power transfer of the ship load from the on-board power plant to the onshore source and back.

The solution also enables ships to shut down their diesel-generator sets used to create onboard electric power and plug into an onshore power source while berthed. Most ships' power generation units operate at a frequency of 60 Hz, whereas the local grid in most parts of the world is 50 Hz. ABB's Static Frequency Converter constitutes a safe, economic and efficient solution which converts grid electricity to the appropriate load frequency.

To become compliant with the demanding requirements concerning port emissions, both ship-owners and ports need to rely on innovative technologies. Shore-to-ship power is an investment which both reduces the environmental burden and saves money in the long-term.

For more information please visit:

[www.abb.com/ports](http://www.abb.com/ports)







# PCS Static Frequency Converter (SFC)

Now the whole world is at the same frequency

ABB's PCS100 and 6000 SFC (static frequency converter) is the answer to bridging the gap in today's industry environments, where equipment has different voltages and frequencies. Providing the ability to shift power to and from the 60 Hz to 50 Hz grids, the PCS100 and 6000 SFC is the economical answer to running your industrial equipment overseas, or your overseas equipment here.

## Typical applications include:

- Where load frequency is different to the local supply
- Relocation of industrial plants; and
- Supplying power to docked ships

ABB offers a complete product range from 125 kVA to multi MVA. The system is internally configured as a parallel arrangement of modular rectifiers and inverters all controlled by a central master controller. Each rectifier draws a clean sinewave current at unity power factor from the utility supply. Each inverter produces a clean sinewave voltage to supply the output load. The modular design makes the system compact and highly serviceable. In the unlikely event of a failure, individual converter modules can be moved and replaced with minimal downtime.

[www.abb.com/powerelectronics](http://www.abb.com/powerelectronics)  
(grid interconnection products)



PCS100 SFC



PCS 6000 SFC

## Advantages

- 50 Hz to 60 Hz and 60 Hz to 50 Hz conversion at any voltage via transformers
- Unity power factor rectifier with a THDi of < 3%
- High efficiency 95% typical
- Overload capability of up to 200%
- Able to parallel with multiple PCS100 SFC or other generators
- Very high system availability through advanced power module redundancy
- Provides output immunity to input disturbances (voltage sags, frequency shifts)



# Wind power

ABB's innovative power electronics solutions for the wind industry.

Wind energy production is rapidly gaining in popularity with thousands of turbines in operation around the world. These include not only large scale wind farms, but also small projects. The global increase of installed wind power has forced transmission system operators to tighten their grid connection rules – also known as grid codes – in order to maintain network quality and stability.

As a consequence, some commonly used turbine designs have difficulties achieving grid code compliance in several parts of the world. To address the global challenge for improved grid quality, ABB offers supplementary compensation equipment, such as STATCOM and ESS.



### Increasing at a rapid rate

According to GWEC (Global Wind Energy Council) over the past ten years, global wind power capacity has continued to grow at an average rate of over 30 percent. This phenomenal increase of installed wind power has led to a change in grid code requirements. These new rules demand that power plants of any kind support the electricity network throughout their operation. In addition, as a significant number of wind farm projects are set up at sparsely inhabited, remote locations, where the electricity grid is relatively weak, the need for add-on equipment, such as ABB's STATCOM, becomes all the more fundamental.

Furthermore, due to linear and gust changes of wind speed, grid power quality is dramatically affected. Thanks to the new energy storage devices, it is possible to store energy from the electricity grid and return it when required; however, such equipment is heavily reliant on a converter to interface with the grid. ABB's ESS (Energy Storage System) is specifically designed to allow a range of energy storage devices to be coupled to the grid, offering advanced features and configuration options.

### Solution required

One of the solutions offered by ABB is STATCOM (STATIC COMPensator), a unique line-up of state-of-the-art technology, which adds the missing functionality to wind parks, thus ensuring grid code compliance. As a pure static device with no switched passive elements, the system provides outstanding performance for both steady state and dynamic operation.

Importantly, the fast dynamic voltage control and the behavior during balanced as well as unbalanced grid faults (fault ride through) allow meeting the stringent grid code requirements. ABB's STATCOM portfolio comprises PCS100 (Power Converter System), which is suited for low-power (<10 MVar) applications, as well as PCS 6000, designed for medium-power (<30 MVar) operations. ABB has successfully supplied both STATCOM solutions to the wind power industry in order to integrate wind parks into grids with demanding connection rules.

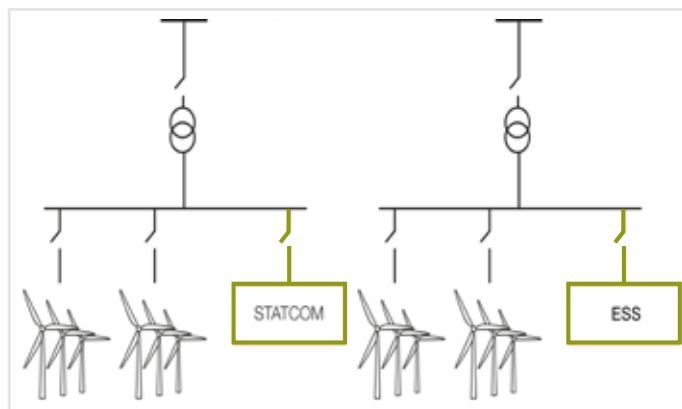
As a full scope supplier, ABB also offers the PCS100 Energy Storage System (ESS), which is a converter platform that enables energy storage devices, such as batteries, flywheel systems and new generation super capacitors to be connected to the grid, thereby strengthening and enhancing the performance, quality and reliability of the system.

PCS100 ESS looks to the power system like a traditional synchronous machine. This is achieved through fast acting Digital Signal Processors (DPS) incorporated into the product design, which allow both real and reactive power to be controlled at near instantaneous speeds. In case the grid supply is lost, ESS can detect this, disconnect itself from the grid and shut down.

The PCS100's ability to store energy is highly scalable. At present, rated power and capacity are typically in the 20 MW range for tens of minutes, but the technology permits up to 50 MW for periods of 60 minutes and more.

### ABB's technology

ABB's Power Converter Systems provide a new dimension in developing smart grids, allowing for a significant increase in renewable energy generation. Both PCS100 and PCS 6000 are characterized by great efficiency (from 97 to 98.5 percent) and high



Principle overview

reliability. Modular construction utilizing leading-edge technology makes the design of both STATCOM and ESS highly configurable and versatile, thereby enabling both indoor and outdoor placement.

The solution is particularly competitive in terms of installation time and space requirements. Furthermore, high efficiency and low maintenance (MTTR<30min) lead to low operational costs. Owing to maximum flexibility, the solutions may be applied to a wide range of applications. These include wind farms, utilities with weak grids or fluctuating reactive loads as well as industrial applications.

Both STATCOM and ESS provide a new dimension in developing smart grids allowing for a significant increase in renewable energy generation whilst maximizing CO<sub>2</sub> free energy generation. They constitute cost-effective, environmentally attractive and high quality services for existing networks.

### Benefits

- Improved plant efficiency
- Grid code compliance
- Enhanced network quality and wind farm reliability
- Fast response in case of instability
- Voltage control – reactive power compensation
- System power factor control
- Flicker mitigation, unsymmetrical load balancing
- LVRT capability
- Active harmonics cancellation

To see further information please visit :

[www.abb.com/energystorageandgridstabilization](http://www.abb.com/energystorageandgridstabilization)





# Minimizing downtime

ABB supplies a power protection solution to Gülermak in Turkey.

Production of heavy duty steel requires an uninterrupted power supply. Without this continuous power feed, industrial producing machines can shutdown resulting in catastrophic events. This can lead to loss of revenue and high production costs, which could potentially have an impact on the steel production line. ABB's PCS100 Active Voltage Conditioner (AVC) is eradicating these potential risks by providing a reliable and efficient solution. This will provide a continuous power regulation with an efficiency rate exceeding 98 percent.



**A**BB's power electronics team based in Napier has provided a turn-key solution comprising of a PCS100 Active Voltage Conditioner (AVC) for a leading mass transport, railway and industrial company, Gülermak in Turkey. This innovative solution will help protect the company's CNC machines from production shutdown, minimizing material costs.

In modern CNC systems, end-to-end component design is highly automated using computer-aided design (CAD) and computer-aided manufacturing (CAM) programs. The programs produce a computer file that is interpreted to extract the commands needed to operate a particular machine via a postprocessor, and then loaded into the CNC machines for production. Since any particular component might require the use of a number of different tools-drills, saws, etc., modern machines often combine multiple tools into a single "cell". In other cases, a number of different machines are used with an external controller and human or robotic operators that move the component from machine to machine. In either case, the complex series of steps needed to produce any part is highly automated and produces a part that closely matches the original CAD design.

Previously, when the CNC machines shut down as a result of power sags, the steel component being produced had to be destroyed or "started over" as the CNC machine programming the design had to start from the beginning of the code (rather than from where the fault occurred). This led to increased production costs in material waste due to power quality problems.

Gülermak chose ABB's 375 kVA PCS100 AVC as a sound solution because of the system's small footprint in design and modularity. Other factors were its high efficiency rate (up to 98 percent) and continuous online regulation (continuous power regulation of +/- 10 percent and +/- 15 percent short term), meant that Gülermak could rely on ABB to deliver a product that is both energy efficient and reliable in power protection.

The ABB PCS100 AVC has a power rating ranging from 160 kVA to 20 MVA. It is an inverter based system that protects sensitive industrial and commercial loads from voltage disturbances. Providing fast, accurate voltage sag and surge correction as well as continuous voltage regulation and load voltage compensation, the PCS100 AVC has been optimally designed to give required equipment immunity from the level of voltage sags expected on the AC supply network.

Gülermak is a global player in engineering and construction of heavy industrial steel constructions and is located in Turkey. The company specializes in engineering and building heavy steel constructions throughout Europe, Russia, North Africa and the Middle East.

To see PCS100 AVC technology information please visit : [www.abb.com/powerquality](http://www.abb.com/powerquality)



**Gülermak factory in Turkey**

### Steel industry outlook to 2017

- Global steel consumption will increase to over two billion tonnes by 2017, a rise of 71 percent on 2007's level.
- Demand for steel in North America and Western Europe is expected to decline before picking up from the third quarter of 2009.
- Demand for steel remains strong in emerging economies, even though growth rates will tend to be lower than historic levels. Asia, led by China, will continue as the world's largest consumer of steel, with its share of global consumption rising from 32 percent in 2006 to 43 percent in 2017.
- Tighter capital markets over the next two years could lead to further consolidation in the steel industry as smaller, highly leveraged firms become vulnerable to acquisition by larger, financially stronger, players.
- The focus regions of the 2008 report are the Balkans and Africa. Of these countries, Morocco is expected to show the fastest growth, with a CAGR of 10.4 percent between 2006 and 2012. Egypt is likely to consolidate its position as Africa's largest steel consumer, with finished steel demand expected to exceed 15 million tonnes in 2017.

**Source: EuroStrategy Consultants**





Inside Karlskrona's factory

# Flawless cabling

Reliable and  
designed for  
industry.

Manufacture of high quality continuous long runs of cable requires a continuous clean supply of electric power. Adverse weather, including storms and flood, accidents and electrical faults on the external distribution system can result in deep voltage sags, surges and short outages which have a devastating effect on cable production. This can result in late delivery to customers, lost revenue, waste and quality problems. The installation of an ABB UPS-I on cable making equipment eliminates these costly problems reducing risk, saving money and giving plant management peace of mind.



# ABB's PCS100 UPS-I caters for the power protection needs of a world-class factory in Sweden.

**M**odernity, outstanding quality and high reliability are the trademarks of ABB's high voltage power cables factory in the historic naval port and UNESCO World Heritage Site of Karlskrona. With its own deep-water harbor and a 160 meter vertical extrusion tower, as well as research and development laboratories, the factory is regarded as one of the most advanced in the world.

The Karlskrona plant creates the world's longest underground and submarine cable installations, including a 580 kilometer-long high voltage direct current (HVDC) submarine cable that enables electricity transmission between Norway and the Netherlands. Today, the factory can also boast maximum efficiency thanks to a power protection system provided by PCS100 UPS-I.

protection solution, PCS100 UPS-I, was chosen. This innovative system disconnects the load from the utility during a power quality event and supplies the load from its storage, allowing processes to ride through common power problems. The extremely high efficiency (typically at 99 percent) of PCS100 UPS-I, together with the system's modularity and small footprint design, constitute a perfect solution for most industrial applications.

The investment in PCS100 UPS-I is part of ABB's plan to double the production capacity of the Karlskrona manufacturing facility to satisfy an increasing demand for high voltage cables. To make this possible, two UPS-I units of 2100 kVA support two individual production lines, effectively eliminating voltage disturbances and outages, thereby improving product quality and



Final installation of the PCS100 UPS-I system

## Features

- Very high efficiency (typically 99%)
- Very high fault capacity compared with standard UPS solutions
- Extensive range of voltages available
- Modular design providing high reliability and short repair times
- Small footprint design
- Custom storage solutions available

To see further information please visit : [www.abb.com/powerquality](http://www.abb.com/powerquality)

The extremely high efficiency (typically at 99 percent) of PCS100 UPS-I, together with the system's modularity and small footprint design, constitute a perfect solution for most industrial applications.

Although the cables manufactured in Karlskrona can be hundreds of kilometers long, every millimeter of each cable has to be flawless. However, as in any facility, the factory is susceptible to grid disturbances, such as voltage sags, surges and outages. These can lead to shutdowns that interrupt manufacturing. Considering the continuity of the cable extrusion process, this potentially results in significant losses, including wasted material, lower production quality, lost production time and late delivery to customers.

For these reasons, special attention was paid to eliminating risks caused by grid disturbances. To secure the factory's operations, ABB's leading edge power

boosting production. The installation and commissioning of the units were performed locally under ABB supervision.

## Solution benefits

- Provides protection against short outages and very deep sags
- Offers protection against utility reclosure events
- Allows process loads to ride through common power problems, increasing yield, reducing product wastage and improving productivity
- Suited to the demanding requirements of industrial applications as well as industrial loads





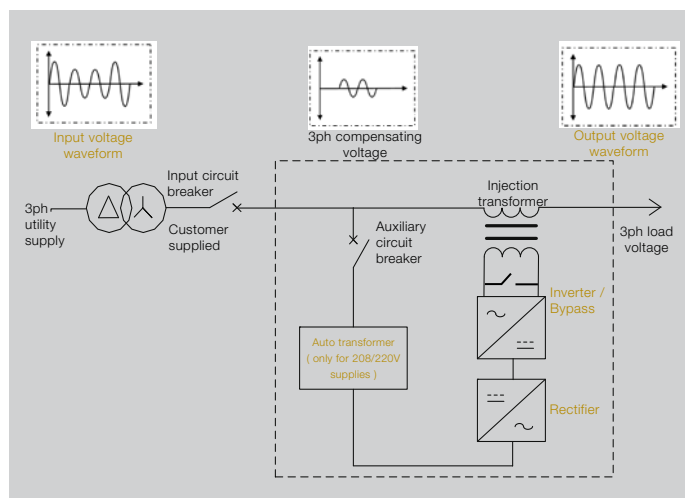
# Protecting the motor

Increasing the rate of production for the largest cellulose plant in China.





The 175 kVA AVCs are protecting the fiber production lines



Single line diagram

Available in load capacities of 160 kVA - 20 MVA the PCS100 AVC has an operating efficiency exceeding 98%.

With heavy duty industries often expanding in size due to heavy demand for their products, it is important that they invest in reliable and efficient equipment. ABB's PCS100 Active Voltage Conditioners (AVC) are protecting motor drives from voltage disturbances at one of the largest cellulose producing plants in China.

Cellulose is the major constituent of paper, paperboard, card stock and textiles made from cotton, linen, and other plant fibers. For industrial use, cellulose is mainly obtained from wood pulp and cotton. It is usually used to produce paperboard and paper (in this case paper filters). To help sustain the ever growing demand for cellulose fiber, the manufacturing facility in China has just undergone its fifth expansion.

#### Behind the scenes

Shutdown of production lines caused by a lack of power protection can adversely harm a company's image due to such contributing factors as failure of delivery time leads, decrease in production and downtime due to repairs. The attractive features of the PCS100, such as reliability, industrial capability, efficiency and small footprint design, made it an excellent choice for the facility.

#### A proven solution

Previously the plant used DC-bank battery solutions to protect their motor drives but a lot of maintenance was required. Therefore two 175 kVA PCS100

AVCs were installed (with five units still to be installed) to protect the fiber production lines from voltage sags and swells.

The main concern had been the quality of production due to constant shut-downs and ongoing maintenance. Therefore ABB's PCS100 team provided a turnkey solution which included the AVCs, maintenance bypass and training of staff at the facility. Another outstanding feature of the PCS100 AVC is that it is virtually maintenance free compared to the previous battery solution. The cost of production losses due to a shutdown had been estimated at US\$500,000.

The PCS100 AVC protects the fiber production lines from severe risks, reducing costs and shutdowns, and has a payback time of less than one year. This cost factor and ABB's leading edge technology appealed to the cellulose fiber company.

The investment in the PCS100 AVCs is part of ABB's plan to increase the rate of production at the facility by installing another five units in the future.

#### User benefits

- Reliable
- Low maintenance
- Small footprint
- High efficiency

#### PCS100 AVC features

- Simple user controls
- Rugged overload capability
- Short circuit protected

- Extensive diagnostics
- Fault log and voltage event data logging
- Ethernet connectivity
- Modular construction

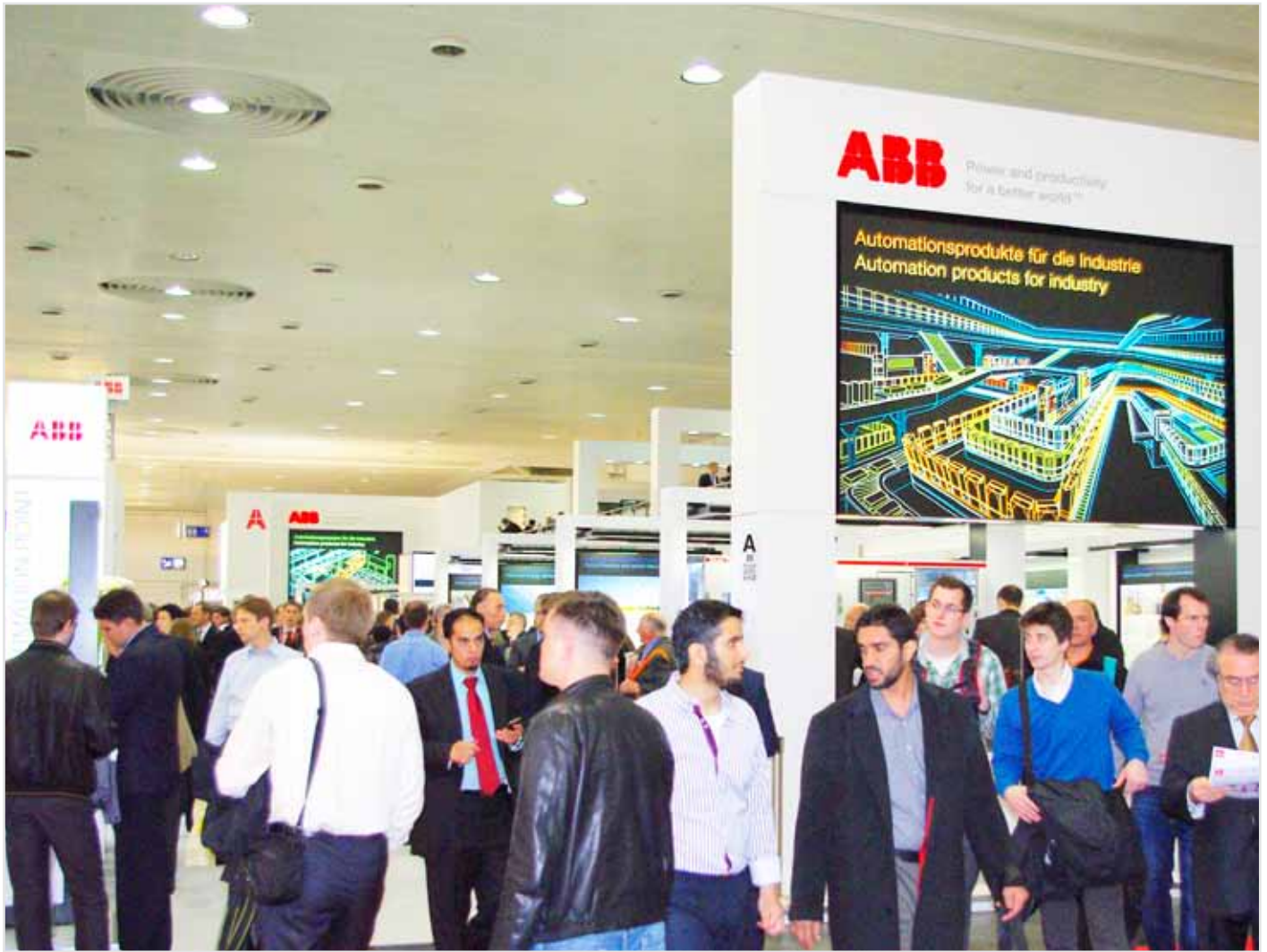
#### Generic performance

- Full correction, three-phase sags down to 70% remaining voltage
- Partial correction, three-phase sags down to 30% remaining voltage
- Full correction, three-phase sags down to 55% remaining voltage
- Partial correction, single-phase sags down to 0% remaining voltage
- Continuous "ONLINE" regulation
- Correction for voltage vector phase angle errors created by faults in the supply
- Voltage unbalance correction
- Flicker mitigation

To see PCS100 AVC technology information please visit :

[www.abb.com/powerquality](http://www.abb.com/powerquality)





# Power converters on tour

The success of Hannover Messe 2012 confirms once again that the world's most important technology show is a powerful driver of investment in new technology and automation.





Torsten Lang, Rolf Weisbrod, Mario Sadowski (from left to right)

Springtime seems to offer a perfect opportunity for special international events, such as fairs, conferences and symposia. This might explain why Europe boasts a significant number of influential exhibitions in the northern hemisphere's spring months, with Hannover Messe (Fair) in Germany, ECC Cold Ironing Technical Conference in Italy, and EXPOPOWER in Poland, amongst others. Such events open up a range of possibilities for promoting the latest technology and innovative solutions.

The world's biggest industrial trade show, the Hannover Messe, was again a success for ABB. Among around 5000 exhibitors who have taken this excellent opportunity to display their products, ABB played a leading part with a highly professional stand, presenting innovative solutions that impressed clientele and competitors. The 1800 square meter exhibition space showcased a comprehensive range of power and automation products, including the power converters platform.

Customers approached ABB representatives to discuss advanced and technically challenging subjects, particularly in areas relating to energy efficiency and network stability.

"We noticed that customers are increasingly concerned about the safety of power grid quality and are looking for solutions to control grids and secure their production processes. We also answered many questions concerning energy storage. There was a lot of interest in the different types of solutions our power electronics platform can provide," said Mario Sadowski of ABB in Germany.

This year ABB's booth featured a newly acquired company – Newave. The UPS leader has added new products to ABB's portfolio, thus providing the missing link to our company's offering in terms of uninterruptible power supply systems. In fact, these enjoyed widespread popularity during the fair, which again proves that business owners are becoming fully aware of power protection needs and are looking for ways to secure the smooth day-to-day operations of their facilities.

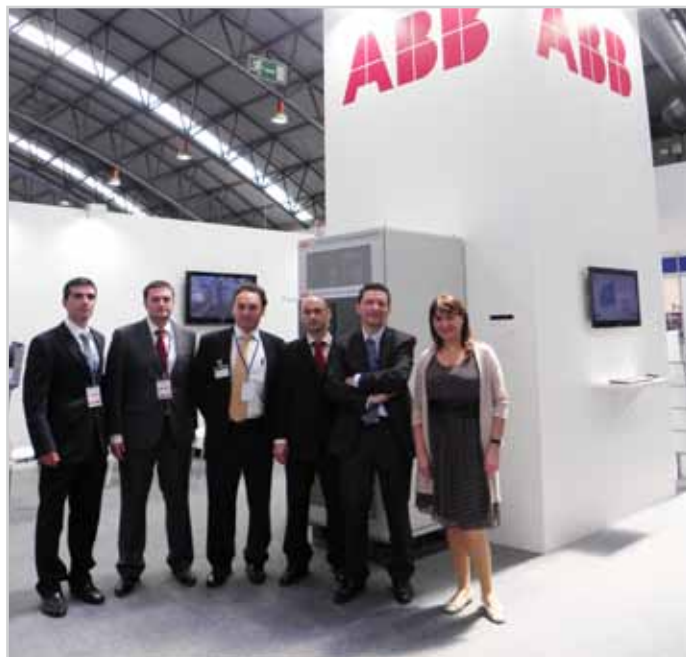


ABB sales team from Spain were directing customers' interest to shore-to-ship solutions

The team effort was also successful with regard to the PCS100 AVR (active voltage regulator) product. A close interest in this smart technology showed that there is a growing demand for this solution – especially among distribution utility companies.

Apart from Hannover Messe, there are other important industry events that occur in Europe. One such event is Navalia, a shipbuilding exhibition that takes place in Vigo, Spain, displaying the latest technology trends, developments and challenges in the shipping and maritime world. ABB's stand with the PCS100 SFC demo unit, attracted significant interest from parties seeking ways to reduce energy consumption in order to become compliant with demanding requirements concerning port emissions.

The leading-edge technology of shore-to-ship power solutions, including PCS100 and PCS 6000 SFC (Static Frequency Converter), captured the careful attention of a broad clientele. This confirmed that ship owners, as well as ports, are becoming increasingly aware that innovative technologies are an important and reliable ally. These solutions are an investment that not only reduces the environmental burden, but also saves money in the long term.

To see information on PCS100 and PCS 6000, please visit : [www.abb.com/powerelectronics](http://www.abb.com/powerelectronics)



# “Smart Country,” one of ABB’s key Smart Grid projects, wins award in the field of energy supply.



A heavy-duty crane positions the medium-voltage regulator onto its base with care and absolute precision (photo: RWE).

The project, sponsored by the Federal Ministry of Economics, commissioned RWE Deutschland and partners from industry and academia such as ABB, Consentec and the Technical University of Dortmund in Bitburg-Prüm in the Eifel with the testing of an intelligent power distribution network in a rural area covering 170 square kilometers. The project delivers answers to the question of how electricity generated from sun and wind can be used efficiently in rural regions while at the same ensuring high security of supply.

## Maintaining supply voltage levels

One of the challenges facing distribution grids is the need to accommodate the increasing number and range of renewable generation technologies while maintaining voltage regulation levels.

The voltage regulators supplied by ABB, which are based on the PCS100 AVC platform, maintain supply voltage levels even during fluctuating power loads from renewable sources. In order to be able to compensate for larger voltage fluctuations in the future, as the decentralized feed-in of power from renewable sources continues to grow, the voltage regulator has a sufficiently large control range of plus/minus ten percent.

In addition, for installation outdoors the voltage regulators must be designed to ensure low noise emissions and reliable year-round operation even in extreme temperatures.

Depending on local conditions and voltage problems, the voltage regulators were integrated as a 20 kV solution either centrally in the medium voltage grid, in existing local substations, or directly at the low voltage end customer. The advantage of ABB’s PCS100 AVC solution is the modular design which allows it to be easily integrated into an existing distribution grid.

On May 22 the German state of Hessen awarded RWE Deutschland with the inaugural “Smart Energy Award 2012” for its “Smart Country” project in the energy supply category. ABB’s role in the project involved further developing several voltage regulators based on the PCS100 AVC power electronics platform and integrating them in the distribution grid.

“With this adaptation to the public grid we have entered completely new territory and expanded our existing know-how,” says Martin Schumacher, the member of the Managing Board of ABB Germany responsible for Power Technologies. “Depending on the problem, we can now offer a configurable solution for a promising new market.”

“This installation represents a significant achievement in the field of distributed generation,” says Jochen Kreusel, Head of the ISI Smart Grids. “This is the first smart grid project we participated

## The voltage regulators supplied by ABB, which are based on the PCS100 AVC platform, maintain supply voltage levels even during fluctuating power loads from renewable sources.

in that has fully concluded and the first one focussing on primary equipment in distribution networks. The project results have the potential to become a blueprint for the integration of distributed generation. It affirms ABB’s and RWE’s commitment to creating solutions that advance the intelligence of power systems.”

A total of 6.2 million euros has been invested in the project which will test the practical feasibility of intelligent grid solutions in the Eifel region.

To see further information please visit :

[www.abb.com/powerquality](http://www.abb.com/powerquality)







ABB exhibition area featuring the PCS100 Active Voltage Conditioner (AVC)

## JECA FAIR 2012 – 60th Electrical Construction Equipment and Materials Fair.

**ABB in Japan exhibited at JECA FAIR 2012 from May 30 to June at INTEX OSAKA. This year, JECA FAIR attracted 195 exhibitors and 93,744 visitors in those three days.**

ABB set up a booth under the theme of “Cost Saving Solutions” and demonstrated the PCS100 Active Voltage Conditioner (AVC) to establish new customer relationships in the Kansai and western Japan area.

The PCS100 AVC, which recovers momentary voltage drops, is based on an innovative battery-less system that leverages ABB’s advanced inverter technology.

Traditionally, UPS systems have been used for power protection problems such as short outages, and momentary voltage drops (sags), etc. However, ABB’s PCS100 AVC introduced an entirely new concept to provide protection for voltage drops that enables the user to dramatically save in set-up and running costs, as well as providing space savings.

Throughout JECA FAIR, ABB’s stand attracted significant interest. Takashi Yamada, Discrete Automation and Motion division, says “It has been about one year since the debut of the PCS100 series in the Japanese market. We are very satisfied with the number of customers we had in our booth, as well as the reaction of these customers to the product.”

“It is also our pleasure to contribute to energizing Japanese markets through introducing our great technologies to Japanese customers.”

Through the JECA fairs in 2011 and 2012 which covered Kanto and Kansai, ABB’s PCS100 AVC has successfully completed its debut in this market.

To see further information please visit : [www.abb.com/powerquality](http://www.abb.com/powerquality)



PCS100 Active Voltage Conditioner (AVC)





# PCS100 Product training 2012

Register your interest now for 7-9 August



Enhance your technical ability and knowledge in the PCS100 product range. Interactive practical training with real devices for demonstration purposes and functional exercises.

## Product training

### Products, applications, markets and technical basics

- Power protection
- Frequency conversion
- Grid connect interfaces

### Marketing

- PCS100 tools and support

### Hardware

- Power modules, aux.module, interfaces

### Control modes, interfaces, options

- Power protection
- Frequency conversion
- Grid connect interfaces

### Order handling process

- PCS100 sizing and pricing

### PCS100 outlook

- Ongoing and future developments

## Who should attend

ABB channel partner sales and service engineers.

## Training locations

ABB's low voltage power converter product trainings are conducted in our well equipped manufacturing and R&D facility in Napier, New Zealand, by highly qualified engineers and instructors.

## Enrolments

Register your interest for any one of our courses via email to: [pq.supportline.nz@nz.abb.com](mailto:pq.supportline.nz@nz.abb.com)

## Confirmation

Confirmation of acceptance and course information will be sent approximately two weeks before the start of the course. We will inform you by email or phone if there are no vacant places.

## Course program

The course program and all related information about the course times and venue are sent to the participants with the confirmation. The course normally runs from 9.00 a.m. - 4.00 p.m. over a three day period.

## Reservations

We reserve the right to change any course schedules, programs and their contents. A course could be cancelled due to minimal enrolment. The maximum number of students varies between 10 - 12 persons.

## Cancellation

In the case of cancellation, inform us as soon as possible. This will allow another applicant to attend the course. Your place on a course can be transferred to another person in your company or department.

## Training schedule 2012

Course	Day one	Day two	Day three
Three	7 August	8 August	9 August
Four	6 November	7 November	8 November
<b>Agenda</b> a.m.	PCS100 product platform overview	PCS100 frequency conversion	PCS100 sizing and pricing tools
<b>Agenda</b> p.m.	PCS100 power protection	PCS100 grid connection	Outlook / future developments

# Service and commissioning training 2012

## Register your interest now for 2012 courses

### Your knowledge. Your power.

ABB is a leading supplier of power electronic systems. This extensive experience and history of innovation helps customers around the world to improve plant performance and production.

Our customer awareness means that we are committed to support customers globally in their plans for growth. ABB offers a wide range of professional training courses adapted to meet the needs of customers and partner channels.

### Benefits of the training

Service and commissioning training courses give valuable supporting to increase return on investment, reduce costs in down time and improve skills and motivation of personnel.

Training participants profit from our extensive experience and modern training infrastructures which enable them to:

- efficiently operate and maintain ABB's PCS100 low voltage power converter systems
- extend the lifetime of the product

### Training locations

ABB's low voltage power converter product trainings are conducted in our well equipped manufacturing and R&D facility in Napier, New Zealand, by highly qualified engineers and instructors.

### Course profile

Our service and commissioning training courses are aimed at qualifying maintenance engineers to undergo unsupervised first level support of ABB's PCS100 applications. The main course goal is to learn how to operate, troubleshoot and maintain the system.

Upon completion of the course, maintenance engineers will be able to locate and identify hardware components, download fault loggers and important information for first analyses by support personnel, replace parts and perform preventative maintenance. Trainees will gain good practical experience using available tools and techniques through organised practical exercise.

### Who should attend

ABB partner channel and customer service engineers.

### Confirmation

Confirmation, reservation details, and all related course information including schedule and venue details will be sent approximately four weeks before the start of the course.



### Enrolments

Register your interest for upcoming courses via email to: [pq.supportline.nz@nz.abb.com](mailto:pq.supportline.nz@nz.abb.com)

### Training schedule 2012

Course	Day one	Day two	Day three
Three	21 August	22 August	23 August
Four	20 November	21 November	22 November
<b>Agenda</b> a.m.	PCS100 platform service introduction	PCS100 service power protection	PCS100 service grid interconnection
<b>Agenda</b> p.m.	PCS100 platform service detailed	PCS100 service frequency conversion	Outlook / future developments

## Behind the scenes



### Project feature

#### 6. Production success

ABB provide power protection to Australasia's leading forest products company

### Industry watch

#### 8. Going for gold

Dynamic voltage control for Canadian mines

### Project completion

#### 10. New beginnings

Power protection is an important factor to prevent expensive recovery costs

### Product feature

#### 12. PCS100 UPS-I

Advancing efficiency with the PCS100 UPS-I

## Collaboration insight



### Project feature

#### 6. PCS100 Static Frequency Converter

ABB provide offshore support for a FPSO customer

### Industry watch

#### 8. Protecting datacenters

PCS100 UPS-I technology leads the way

#### 10. Oil and gas

ABB's power electronics solutions for the oil and gas industry

### PCS 6000

#### 12. Powering up

Solution for Fullabrook wind farm project

#### 14. Keeping on track with technology

The first PCS 6000 static frequency converter binds public grid with the railway grid in Norway





Connect renewable power to the grid?

Absolutely.



Electricity generated by water, sun and wind is most abundant in remote areas like mountains, deserts or far out at sea. ABB's PCS100 Energy Storage System (ESS) helps renewable power reach about 70 million people by integrating it into electrical grids, sometimes over vast distances. Our effort to harness renewable energy is making power networks smarter, and helping to protect the environment and fight climate change.

[www.abb.com/powerelectronics](http://www.abb.com/powerelectronics)