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insider

A customer magazine
of the ABB Group
New Zealand



Power from within

Energy saving solution – 06

PCS100 ESS provides a battery solution for Dietikon Powerplant

Semiconductor Industry – 12

ABB protecting a leading semiconductor wafer foundry in Malaysia

Medical intelligence – 14

PCS100 AVC preventing the shutdown of Samsung's cancer treatment machines

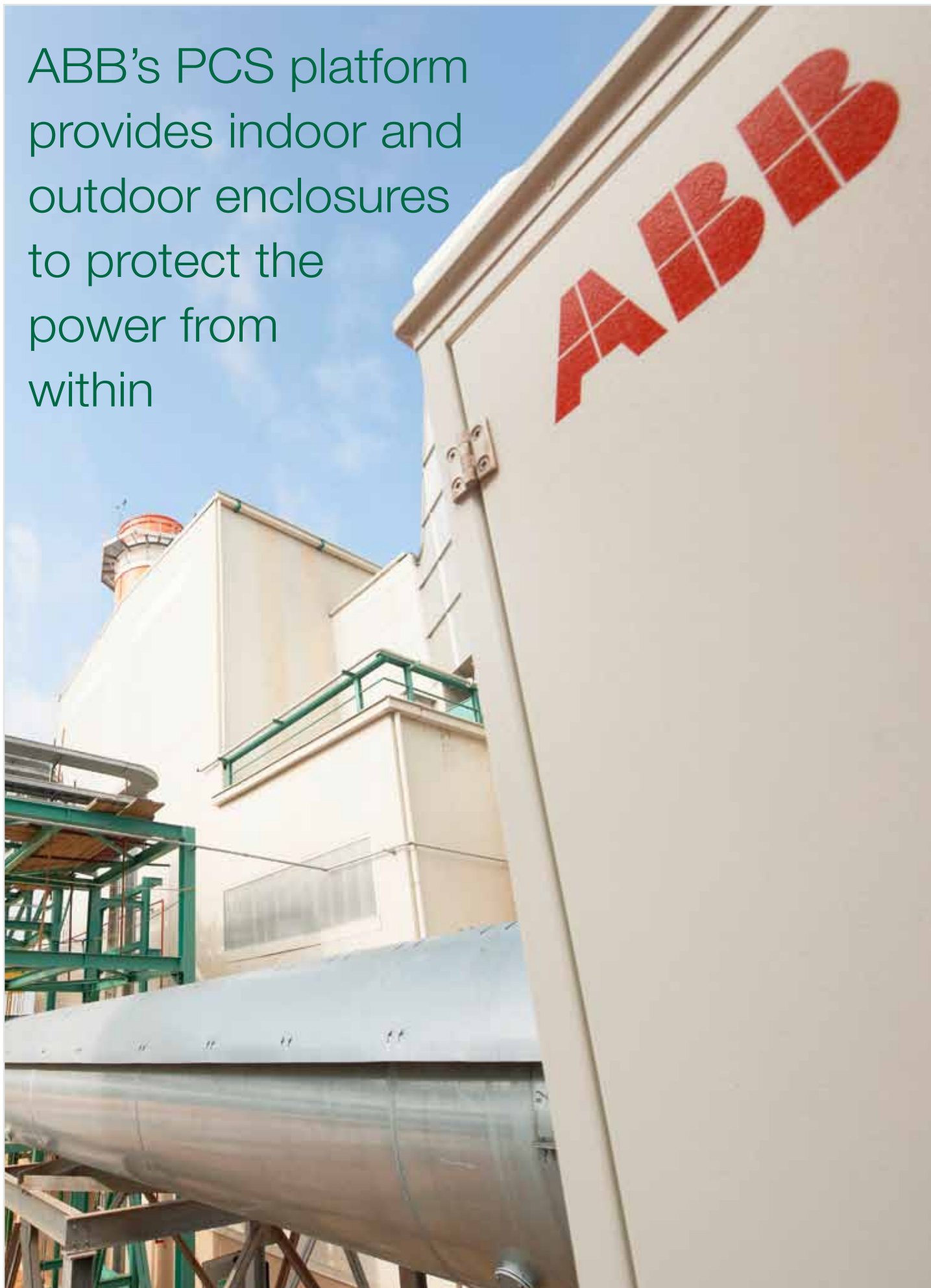
Going green – 16

Environmental compliance for a Swedish port

Power and productivity
for a better world™



ABB's PCS platform
provides indoor and
outdoor enclosures
to protect the
power from
within



4|12

Insider

**John Penny**

General Manager
LV Power Converter Products (DMPE)

As a power electronics engineer with too many years of experience to mention, I continue to be excited by the range of new innovations in core technologies and solutions. In low voltage power electronics, technology has developed from thyristor controlled inverters to bipolar transistors and then Insulated Gate Bipolar Transistors (IGBT's) and Integrated Gate-Commutated Thyristors (IGCT's). Now silicon carbide devices are starting to show real promise. None of this is of much use without sophisticated control and many of ABB's R&D engineers are working on control algorithms and software.

The most common applications of this technology have historically been industrial motor drives but there are many other appli-

cations and these are the focus of this magazine. The challenge for our product managers and engineers is to identify applications that add real value for our customers - such things as keeping the electrical power clean, through to shore to ship supplies reducing environmental pollution.

The last introduction to the Insider magazine was written by Olivier Suter who has changed roles and shifted to lead the Power Electronics team in China. Olivier's position as Medium Power Converter Products General Manager has been taken on by Adrian Zurbriggen. Adrian had been running the closely associated medium voltage wind converter business. In the specialty power converter field, Adrian leads the Swiss-based medium voltage team and I lead the New Zealand-based low voltage team, with both businesses having a wide global spread. This includes China where Olivier will continue to be closely involved, developing Power Converter business in this key market amongst other tasks.

ABB continues to strengthen its position in Power Protection. Applications for the industrially targeted Active Voltage Conditioner and UPS-I product ranges continue with traditional semiconductor applications like SilTerra through to the protection of sensitive medical equipment (both featured in this issue). The other

interesting development for ABB is the entry into the commercial UPS market with last year's acquisition of Swiss company Newave. Newave products are very complementary to the AVC and UPS-I, and now position ABB as a major player in the Power Protection market.

Grid support with converters for STATCOM and Battery Energy Storage System (BESS) applications is another exciting area of business development. In this issue an article on a BESS application for EKZ in Zurich demonstrates the flexibility of PCS100 grid interface solutions. There are also many exciting opportunities for energy storage in remote power and microgrid applications, to allow high penetration levels of renewables such as wind or solar often displacing diesel generation.

Enjoy the magazine!



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Grid interconnection : www.abb.com/shoretoshippower

Energy storage systems : www.abb.com/energystorageandgridstabilization

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Medical intelligence

Samsung Medical hospital in Korea leading the way for the future



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Going green

Another Swedish port goes green with the help of PCS 6000 SFC



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Scan our QR Codes with your smart phone to find web links, videos, coupons, or event pages, providing further details about ABB's products or services. QR Codes appear throughout this magazine. Scan the one on the left to subscribe to Insider. To use QR Codes with your smart phone camera, download a free QR Code scanner to your phone.



Organizational announcement – Global Product Line, Medium Voltage (MV), Power Converters

ABB are pleased to announce that Adrian Zurbriggen has been appointed Head of Global Product Line "MV-Power Converters" within the product group, Power Electronics. He succeeds Olivier Suter, who has taken over the role as Line Business Unit Manager in China as announced earlier. Adrian will report to Ernst Roth, Local Product Group Manager of Power Electronics based in Switzerland, and in his global role to Conrad Jansen, Product Group Manager for Power Electronics.

Adrian has been with ABB since 1996 and held several roles in sales and management in Medium Voltage Drives and Medium Voltage Power Converters. In his most recent assignment he successfully built up the power converter product business.

Adrian Zurbriggen
GPL of MV Power
Converter Systems (DMPE)



PCS100 ESS 1 MW / 500 kWh battery solution at the Dietikon Powerplant based in Switzerland

Energy saving solution

PCS100 Energy Storage System provides a battery solution to one of Switzerland's largest energy distributors.



ABB, together with the Canton of Zurich's power company (EKZ), has successfully installed a 1 MW power battery solution at the Dietikon Powerplant. The battery is integrated with ABB's PCS100 ESS (Energy Storage System) and is the largest of its kind to be installed in the Swiss distribution network. By improving power quality and grid stabilization, the PCS100 ESS will help preserve 500 kWh of energy – the equivalent consumed by a four-person household in 40 days.

Electricity is a vital part of a nation's infrastructure. In contemporary life we are utterly reliant on the electricity grid to supply power for industrial operations and general day-to-day living. A reliable and efficient grid connection is key to this public utility. The prime function of ABB's PCS100 ESS is to provide a spinning reserve of power in the event of power plant or transmission line equipment failure.

By using power electronics and advanced control, the PCS100 ESS looks

like a traditional synchronous machine to the power system. There are no large spinning masses. Even inertia can be modeled within the system, enabling it to deliver or draw power to and from the grid, dependent on the system frequency and rate of change. Should the grid supply be lost the PCS100 ESS can detect this, disconnect from the grid and shut down.

This leading edge technology enables power plants, like the Dietikon Powerplant in Switzerland, to operate at their full potential without the interruption of voltage sags and swells.

Behind the scenes

The system at Dietikon Powerplant was built over a nine-month period, and is now incorporated into the medium voltage network of the EKZ. This will allow ABB and the customer to closely monitor the integration and behaviour of the battery storage, providing valuable knowledge for future installations.

Working together

The solutions supplied by ABB included a frequency converter that utilises efficient power semiconductor technology to convert the AC supply into DC for use via the battery, and vice versa. The battery is equipped with ABB control and protection systems. Based upon the input parameters and the defined equipment footprint, it was decided to package the PCS100 ESS in a freestanding outdoor enclosure.

The PCS100 ESS was for the first time integrated together with LG Chem batteries and supervisory controls. Battery integration and packaging was performed by ABB in Hungary.

The PCS100 ESS was designed to be primarily controlled via an external SCADA system, and operated in five primary control modes. These were scheduling (P/Q), peak-shaving / generation-smoothing, frequency regulation, islanding and advanced algorithms. Furthermore, one of the control modes – island mode func-



Battery container with LG Chem battery



The complete package: PCS100 ESS converter, LG battery, switchgear and transformer

Energy efficiency is achieved with minimum energy consumption.

tioning – was coupled with a VSI mode (voltage source inverter) to provide enhanced power quality and protection. The island mode is used when the system is disconnected from the main grid / power supply. In this case, the PCS100 ESS creates and maintains a microgrid of defined voltage and frequency, allowing independent operation. It supplies the connected loads from the battery and can also integrate renewable sources and use additional energy to charge the battery storage. This has the advantage of supplying loads when the main grid is not available, and defines how much power will flow in and which unit will be operational.

Project highlights

Peter Franks, head of Energy Distribution at EKZ, commented, “We are very pleased that we were able to implement this pioneering project here in Dietikon. This compensates for battery memory, short-term load changes in the distribution grid and serving locally produced electricity that again, can bring interesting new approaches to the distribution network operators. The knowledge we gain with this system contributes to securing the future of energy.”

Robert Itschner, Head of T&D Substations in ABB Switzerland, reiterated, “We are interested in how the system will prove charging and discharging of the battery bank in the field, in order to develop algorithms that allow optimal operation. The findings are to lead the way for such facilities, for the use of renewable energies, and their optimal use will continue to play an important role. Energy storage is a key component of future smart electricity grids.”

Looking towards the future

ABB and EKZ can look back on an already long and close relationship and are confident in PCS100's ability to help improve network stability and ensure greater security of supply. EKZ is one of Switzerland's largest energy distribution companies. An estimated one million people benefit from a safe, environmentally friendly power supply generated by the company.

EKZ is involved with numerous measures to increase energy efficiency and promote renewable energies.

ABB's PCS100 ESS Technology

The PCS100 ESS is available in load capacities from 100 kVA to multi MVA and allows control of both real power (P) and reactive power (Q) based on system requirements. Advanced control features in the “Generator Emulation” mode of operation make this storage system look like a true power system component. The PCS100 ESS offers power system load leveling, grid stabilization, grid compliance for renewable and generation systems, and power quality improvement.

The PCS100 ESS provides wide bandwidth performance with a flexible and highly modular power electronic configuration. New energy storage devices, such as latest generation batteries, fly-wheel and super capacitors, provide the opportunity to store energy from the electricity grid and return it when required. Also this can be used with any kind of DC storage/source. This offers a range of options to strengthen and enhance the performance, quality and reliability of smart electricity grids.

To see further information please visit:

www.abb.com/energystorageandgridstabilization



PCS Static VAr Compensator (STATCOM)

Low and medium voltage products

Connecting the unconnectable

ABB's PCS100 and 6000 STATCOM (static VAr compensator) provides the missing link between technically incompatible networks, at the same time enhancing power quality, plant reliability, network stability and transmission capacity. As a pure static device with no switched passive elements, the system provides outstanding performance for both steady state and dynamic operation.

Typical applications include:

- Utilities with weak grids or fluctuating reactive loads
- Unbalanced loads
- Arc furnaces
- Wind farms
- Industrial mills
- Mining

ABB offers a complete product portfolio comprising PCS100 suited for low-power (<10 MVar) applications, as well as PCS 6000, designed for medium power (<50 MVar) operations. Both PCS100 and PCS 6000 are characterized by great efficiency (from 97 to 98.5 percent) and high reliability. The modular construction makes the system highly configurable as well as functional.

www.abb.com/powerelectronics
(energy storage & grid stabilization)



Advantages

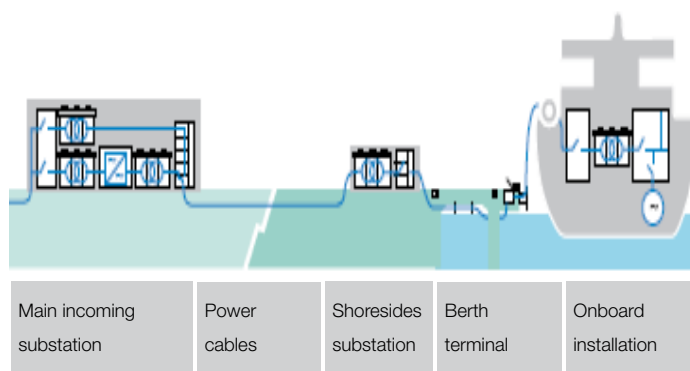
- Voltage control – reactive power compensation
- Flicker mitigation, unsymmetrical load balancing
- System power factor control
- Active harmonics cancellation
- LVRT and HVRT capability



Connecting to the grid

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

Shipping facilitates around 90 percent of international trade. Although this figure seems impressive, it also entails a heavy impact on the global environment. Facing tight environmental regulations, shipping operators and port authorities have to find ways to reduce emission and noise levels. ABB's new Static Frequency Converter technology helps to keep these to a minimum, ensuring necessary legislation compliance.



Overview of a shore-to-ship power connection

Pollution control

In the majority of ports, ships at berth use their diesel generators to run amenities, such as heating, ventilation and cooling, as well as galley equipment. Because of that, they produce noxious emissions which have a negative impact not only on the surrounding environment, but also on the global climate.

At the same time, noise and vibrations from ships seriously affect the life quality of local communities. Mounting pressures to reduce the pollution generated by the world's fleet and the rising costs of fuel have forced ship-owners to adopt a proactive approach to measuring and monitoring combustion, which is reflected in such schemes as marine fuel management (MFM).

However, going green and becoming compliant with the demanding requirements of regulatory authorities, such as IMO/MARPOL and EU, call for decisive steps. And this is where advanced technology steps in.

Shore-to-ship power

Shore-to-ship electric power supply, also known as "cold ironing," is the most reasonable and cost-effective choice for greener ports and fleet. The solution enables ships to shut down their diesel generators and plug into an onshore power source while berthed. However, most ships' power generation units operate at a frequency of 60 Hz, whereas local grid in most parts of the world is 50 Hz. This means that providing ships with electricity requires a shore-side electricity supply arrangement.

ABB's solution

As a technology pioneer in high voltage installations for marine applications, ABB offers Static Frequency Converters (SFCs), which are a safe, economic and highly efficient solution converting the grid electricity to the appropriate load frequency. This leading-edge frequency conversion technology guarantees a seamless automated power transfer of the ship load from the onboard power plant to the onshore source and back.

This solution contributes to a significant reduction of fuel and lubrication oil consumption, which means less pollution and improved financial benefits. Shore-to-ship power is especially applicable to ships operating on dedicated routes, and vessels that consume large amounts of power while in port. This could bring real benefits for terminal operators whose ferries berth each day for a fixed number of hours.



General overview of onshore power supply

Versatility, integrity and unrivalled flexibility

The SFC system is internally configured as an arrangement of modular rectifiers and inverters controlled by a power electronic controller. This unique line-up produces sine wave voltage to supply the output load. The converters also allow for the control of reactive power on the ship as well as on the shore side. This feature permits maximum flexibility in adjusting the system to suit the customer's needs. The SFC portfolio includes PCS100 (Power Converter System), suited for low-power applications, as well as PCS 6000, designed for medium-power operations.

The modularity and scalability of these systems enable multiple units to be paralleled, which makes the solution adaptable to the different power requirements of ships and to a variety of port infrastructures. The PCS100 and PCS 6000 SFC have a small footprint design and can be placed indoors or outdoors. This gives the customer flexibility with the physical and spatial layout to harmoniously fit to the surrounding architecture.

Low operational impact

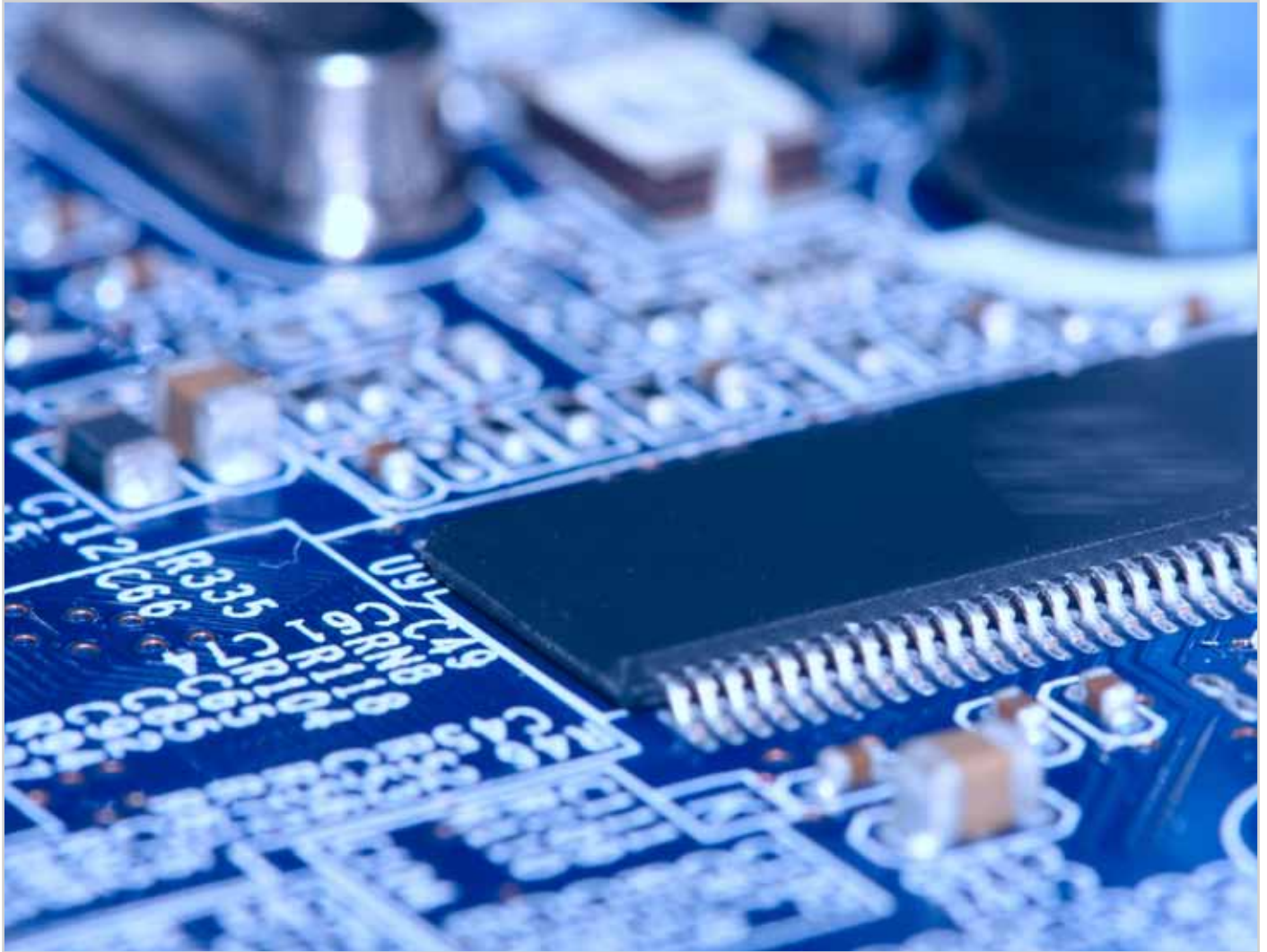
Another advantage of the system is its superior availability due to high reliability and low maintenance (MTTR<30min), which leads to low operational costs. The cost of ownership may be further reduced thanks to the possibility of incorporating renewable energy sources, such as wind or hydro power, solar panels and fuel cells, which can open up a range of new opportunities.

ABB's offering includes comprehensive turnkey shore-to-ship power solutions, from electrical infrastructure on ships (retrofits or new installations) to electrical infrastructure in ports, as well as connection and control solutions to ensure personnel safety and seamless power transfer.

To see further information please visit:

www.abb.com/shoretoshippower
(grid interconnection products)





Modernizing electronics

ABB provides a power protection solution for Malaysia's leading semiconductor wafer foundry.

Fabrication processes rely heavily on continuous power protection. Power disturbances can result in increased costs in recovery time, resulting in loss of revenue. This will ultimately have an adverse effect on a company's operations. ABB's PCS100 Active Voltage Conditioner (AVC) is eliminating these potential risks by providing a reliable and efficient solution for a leading semiconductor wafer foundry based at the Kulim High-Tech Park in Malaysia.



Date	Time	Type	Origin	Description
2012-06-16	15:57:05.73	Sag end		
		Running		110 ms, 27%, 72%, 74%, 70%, 91%, 86%
2012-06-16	15:57:05.62	Sag start		
		Running		
2012-06-05	17:34:05.15	Sag end		
		Running		30 ms, 89%, 95%, 93%, 100%, 99%, 99%
2012-06-05	17:34:05.13	Sag start		
		Running		
2012-06-02	14:35:07.54	Sag end		
		Running		60 ms, 91%, 87%, 88%, 99%, 99%, 99%

PCS100 AVC helps the wafer foundry ride through a massive sag event

The semiconductor industry is becoming increasingly important as semiconductors serve as the basic building materials for important electronic components. Semiconductor devices are extremely small, light-weight components that consume a small amount of power and are highly efficient and reliable. Today, the semiconductor industry has grown to be a \$249 billion dollar industry, representing close to 10 percent of world GDP.¹

The semiconductor company in the Kulim High-Tech Park incorporates value-added methods for the rapid manufacture of new technology as the demand continues to increase.

Established in 1995, the wafer foundry offers CMOS design and a broad range of fabrication processes for integrated chips (IC) in advanced logic, mixed signal and radio frequency as well as high voltage applications. The CMOS high voltage technology used in the design and fabrication of Display Driver IC (DDI), is widely used in mobile phones, GPS equipment, Personal Media Players (PMP), digital cameras and other applications.

In view of the nature of its operations, the foundry relies on highly sophisticated equipment that is immensely sensitive to voltage fluctuations. Voltage dips, lasting as briefly as several milliseconds, will have an adverse impact on the company's profile as the cost of scrapping damaged goods and plant start-up could run into millions.

With a sag and spike event occurring on average two times a month at Kulim Hi Tech Park, it was necessary to adopt ABB's power protection solution of four 750 kVA PCS100 AVCs units. This leading edge technology protects four fabrication lines, with another four PCS100 AVC units protecting the wafer fabrication production floor. The PCS100 AVCs are installed in a temperature-controlled room in order to prolong the lifetime of the units.

The PCS100 AVC solution was chosen for its range of unique features: the units require no battery, they have a 98 percent efficiency rate, they are easy to replace and they offer reliable protection with a small footprint. The package includes the PCS100 AVC itself, training, testing and commissioning. Also included in the package were ABB air circuit breakers and protection relays.



PCS100 AVC installation in a temperature controlled room

A true test of PCS100 AVC was a massive sag event occurring on 16th June. ABB's technology was able to ride through this event, enabling the production line to operate as normal without any sags or swells, proving that the foundry can rely on the new power protection package.

Jonathan Teo, Local Business Unit Manager for ABB Malaysia's Discrete Automation and Motion Division says, "We are pleased that the foundry has chosen ABB's Active Voltage Conditioner to ensure optimum power protection for its plant operations. I'm confident that this project will be a vital stepping stone for ABB into the Kulim Hi-Tech Park which is a national centre for advanced technology manufacturing and innovation."

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.

Standard models offer enhanced performance allowing correction of voltage sags and surges. The PCS100 AVC model provides continuous regulation within +/-10 percent of the nominal mains voltage and also removes voltage unbalance from the supply.

To see PCS100 AVC technology information please visit:

www.abb.com/powerquality

1. Source: Wikipedia - Semiconductor industry





Medical intelligence

PCS100 AVC
exceeding 98
percent
efficiency rate

ABB's Power Electronics team has successfully installed four PCS100 Active Voltage Conditioners (AVCs) into Samsung Medical Center (SMC), based in Korea. The main purpose was to protect cancer treatment machines from voltage distortion. These machines are very expensive and are prone to shutting down when exposed to voltage sags and swells. A shutdown during a treatment cycle can disrupt the treatment program, and have a direct impact on the patient. With its small footprint in design and high efficiency rate, the PCS100 AVC is eliminating the risks of power disturbances.

ABB's PCS100 AVC protects cancer treatment machines for Samsung Medical in Korea.

Today, the medical environment is increasingly reliant on leading edge technology and machines that assist in the diagnosis and treatment of patients. Without these machines and the contributions they make to medical intelligence, medical science and research would be greatly hindered in its quest to cure diseases.

Insight into the future

ABB's PCS100 AVCs were selected and installed to protect the cancer treatment machines which are a core component of Samsung's specialist hospital. To help ensure SMC's future goals of becoming a world class medical institute, it was vital that their equipment was guarded by leading edge power protection technology. To ensure further growth, SMC opened the Samsung Cancer Center and Samsung Cancer Lab in 2008 and 2009



Samsung Medical Center (SMC) has successfully incorporated and developed an advanced model with the motto of becoming a "patient-centered hospital," a new concept in Korea

vide are able to sustain single and three phase voltage sags. Another advantage is the high efficiency rate exceeding 98 percent, making the units extremely reli-

able above ground and five floors underground, housing 40 departments, 10 specialist centers, 120 special clinics, and 1,306 beds. The 655-bed Cancer Center has 11 floors above ground and eight floors underground, with floor space of over 100,000 square meters. SMC is a tertiary hospital manned by approximately 7,400 staff including over 1,200 doctors and 2,300 nurses.

The SMC installation is the PCS100's largest medical application to date.

respectively. The Samsung International Medical Center will open in 2015. Therefore investment in power protection is crucial for ensuring that SMC is prepared for the future.

ABB's technology and solution

SMC were concerned that their cancer treatment machines would experience potential premature failure of components due to supply voltage fluctuations. Power quality events were disrupting the operation of the cancer treatment and scanning machines, compromising the level of service offered to the hospital's customers. Disruption of operations would ultimately add to the operational costs and lead to unscheduled downtime for maintenance to bring the machines back to their original state. With the installation of the PCS100 AVCs, voltage dips and swells have been prevented.

The solution included two 300 kVA and two 600 kVA PCS100 AVCs. The PCS100 AVCs being three phase machines, pro-

able giving the cancer machines with immunity from the voltage sags that occur on the AC supply network.

The SMC installation is the PCS100's largest medical application to date. Since this project was a retro fit, the PCS100 AVCs, with their small footprint design, were incorporated because they provided the kVA protection required within the limited installation space available.

A proven success

Mr Kim of Woojin Electrical Machinery said, "SMC are very happy with the PCS100 AVCs as they have provided the protection they required being a very energy efficient solution which fitted in with the intelligent building concept."

SMC background

The SMC, located in Seoul, Korea, consists of a hospital and a cancer center. The hospital is located in an intelligent building with floor space of more than 200,000 square meters with 20 floors

Since its foundation in 1994, SMC has successfully incorporated and developed an advanced model with the motto of becoming a "patient-centered hospital" – a new concept in Korea.

To see PCS100 AVC technology information please visit:
www.abb.com/powerquality





Ystad Port located in Sweden

Going green

ABB's shore-to-ship solution helps to ensure environmental compliance at the Swedish port of Ystad.

Another Swedish port goes green with shore-to-ship power thanks to ABB's Static Frequency Converter system. Port authorities of the city of Ystad in the south of Sweden have decided to invest in the latest power electronics technology to minimize the negative environmental impact of vessels remaining at berth.

With around 3,500 vessels served per year, Ystad is the fifth largest port in Sweden. Its operations are based primarily on ferry traffic

that follows dedicated routes to Poland and Denmark. The considerable number of ferries berthing daily for a fixed length of time results in high emission and noise levels. These are caused by the onboard diesel generators used to provide electricity for the vessels to run basic amenities, such as heating and ventilation.

Embracing sustainability

In order to mitigate this adverse influence, Ystad Hamn chose the proven technology of the shore-to-ship power connection. This



Björn Boström, CEO of Port of Ystad



One of the cranes enabling the shore-to-ship connection

seamlessly integrated system enables ships docked in the port to shut down their diesel engines and plug into an onshore power source, thus cutting emission and noise levels.

Solution

Most ships operate with 60 Hz electricity, whereas the local grid in most parts of the world is 50 Hz. ABB's PCS6000 Static Frequency Converter platform converts grid electricity to the appropriate load frequency, thus replacing motor generator sets. The additional flexibility of the solution allows it to be accommodated to the specific requirements of each project. The uniqueness of this investment is that multiple vessels can be powered simultaneously, regardless of their system frequency – whether it is 50 Hz or 60 Hz – making the solution particularly convenient for the ships coming into Ystad.

ABB worked in conjunction with Processkontroll Elektriska AB, the general contractor. As part of the solution, ABB provided PCS 6000 Static Frequency Converter at 6.25 MVA, power transformers, medium-voltage switchgear, control and protection equipment. ABB's power systems team was also responsible for the electrical design, settings for the protection relays on shore, project management and commissioning.

Result

According to preliminary estimates, the shore-to-ship power connection will cut emissions by 97.5 percent, thus ensuring compliance with environmental regulations and improving the quality of

life of the local community. "It is important to us that our services are environmentally friendly. Besides, we calculate that the effects on the environment will turn out so positively for Ystad's inhabitants that the total socioeconomic balance will be on the plus side," said Björn Boström, Managing Director of the Port of Ystad.

Benefits all around

Undoubtedly, the shore-to-ship solution is an investment which guarantees significant benefits in the long run. In addition, it does not incur further expenditure as operating and maintenance costs are minimal.

As far as the daily management of the on-shore power supply plant is concerned, it does not require any assistance from the port personnel. The switching process takes place onboard and is very easy to handle. After the synchronization against the local grid, the load is transferred to the shore-side installation and the onboard auxiliary generators are automatically switched off. This translates to lower fuel bills and less pollution.

To see PCS 6000 SFC technology information please visit:

www.abb.com/shoretoshippower
(grid interconnection products)



PCS100 Product training 2012

Register your interest now for 6-8 November



Enhance your technical ability and knowledge in the PCS100 product range. Receive the benefit of 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 training is 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

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
Four	6 November	7 November	8 November
Agenda a.m.	PCS100 product platform overview	PCS100 frequency conversion	PCS100 sizing and pricing tools
Agenda p.m.	PCS100 power protection	PCS100 grid connection	Outlook / future developments

Service and commissioning training 2012

Register your interest now for November 2012

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 supporting 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 support 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 training is 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 goal of the course 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 practical experience using available tools and techniques through organised practical exercises.

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

Training schedule 2012

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

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

Powering the future



Project feature

6. Environmentally friendly

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

Industry watch

10. Wind power

PCS100 and PCS 6000 powering the industry

12. Steel industry

ABB supplies a power protection solution to Gülermak in Turkey

Project completion

14. Flawless cabling

Making an impact in leading edge manufacturing

16. Protecting the motor

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



Converting the world's ports into living areas?

Naturally.



As a full scope supplier, ABB provides comprehensive turnkey shore-to-ship power solutions based around the PCS 6000 SFC (Static Frequency Converter) platform, which provides an answer to growing environmental concerns by helping to reduce emissions, vibrations and noise levels in ports. This proven and cost-effective package enables terminal operators to comply with local and international environmental regulations, at the same time as offering a better place to live for local communities.

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