

insider



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ABB, is an official supplier to Emirates Team New Zealand, one of the contenders in this year's America's Cup regatta. ABB will provide power conversion technology during this period to help power the New Zealand base.



Cover photo and inside cover photo: Courtesy of Emirates Team New Zealand

Insider



Amina Hamidi

Product Group Manager
Power Protection

As you will see from this issue of Insider magazine, a lot has happened in our business since my last editorial.

A big item of news from our Napier, New Zealand colleagues, is the order for 22 PCS100 AVCs from chip-maker, Hynix - one of the world's biggest semiconductor manufacturers. These units will help protect the company's production facilities, and the fact we won this order despite stiff competition underlines the excellence of these products.

Moving from land to sea, ABB, together with local business partners, completed a very significant order from Petronas, Malaysia, with the delivery and commission of uninterruptible power supplies (UPS) to an offshore oil platform. Because the offshore environment can be very harsh and remote, the client had pursued a very tough product as-

essment before settling on ABB's UPS. The deal clincher was the fact that our innovative and rugged decentralised parallel architecture (DPA) delivers high availability and reliability, and repair and maintenance is easily accomplished by non-experts. One set of 4 x 40 kVA DPA modular hot-swappable UPS' and two sets of 3 x 30 kVA DPA modular hot-swappable UPS' were supplied. The significance of the order lies in the fact that this is our very first UPS installation in an offshore platform. Staying with matters nautical, our New Zealand colleagues had an interesting installation when the Emirates Team New Zealand yachting team chose PCS100 for its base during the upcoming regatta in San Francisco.

Moving up the globe, to mountainous Papua in Indonesia, three thousand meters above sea level, we find that an ABB PCS100 Energy Storage System in a solar power plant (the world's highest, in fact) has radically changed community life.

The remoteness of the location, which is only accessible by air, meant that the area, until now, relied on a single diesel power plant. However, ensuring a regular supply of diesel fuel was costly and challenging, so the electricity company, decided to build an off-grid solar power plant. ABB took pride in supplying a 315 kVA PCS100 Energy Storage System (ESS) to store excess daytime electrical power generated from the PV modules.

As well as representing the company at the Hannover trade fair, the team has been busy with the ABB Automation World event in China,

where the DPA 500 and PCS100 Active Voltage Conditioner were some of the highlights.

Lately, we have also been concentrating on our power protection products for mission-critical rail applications. Trains are such a common sight that we seldom think of the sophisticated infrastructure that is essential for the smooth running of the service and how reliant the service is on electrical power. Apart from the obvious ones like the overhead gantries feeding power to electric trains, there is a entire world of other applications for which electrical power is critical: traffic management systems like control rooms, data centers and computer rooms; automatic train protection systems; traffic lights; level crossings; railroad points; video surveillance and communication; ticketing machines; lifts and so on. Even a minor disturbance in the power supply can have a knock-on effect and result in major disruption to the rail network. More importantly, the reliable functioning of the railway infrastructure is not just a matter of convenience – it is also a serious health and safety issue.

Our UPS' help to keep this railway world moving safely and punctually. We will report on these rail applications in more detail in future editions of this magazine.

I hope you enjoy this edition of Insider.



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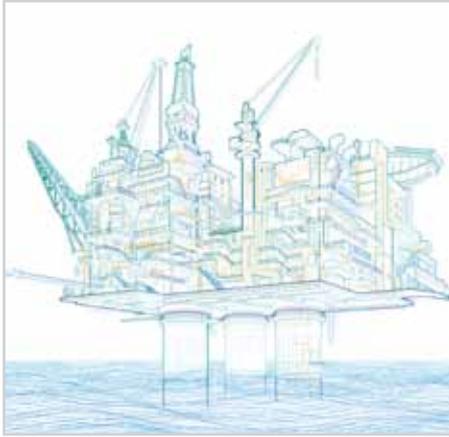
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UPS and Power Conditioning: www.abb.com/UPS

Latest Videos

[ABB's PCS100 center of excellence overview](#)



[PCS100 UPS-I - Industrial UPS](#)





Faster than the wind

ABB's PCS100 Static Frequency Converter (SFC) powering Emirates Team New Zealand's base during the America's Cup regatta.



Emirates Team New Zealand (ETNZ), twice winner of the America's Cup, is taking on the grueling experience in challenging conditions this year in San Francisco, which includes the Louis Vuitton Cup from July 7th to September 22nd. An experienced team, many expect the Kiwis to be among the top challengers. Led by managing director Grant Dalton and skipper Dean Barker, ETNZ will once again carry the hopes of their nation into battle, in the America's Cup. ABB, Official Supplier to Emirates Team New Zealand, has supplied a PCS100 SFC, that will power ETNZ's base during this period.

In previous years, ETNZ's base was constructed using new and existing 40 foot containers and canvas tents that were wired in New Zealand. A new and economical solution was desired that would make it easier to convert the supplied voltage from the San Francisco base (480 V 60 Hz) to the New Zealand base (400 V 50 Hz). Thanks to ABB's leading edge technology, this could be achieved using a 250 kVA PCS100 SFC. ABB's highly efficient system (95 percent) coupled with its compact design, will provide seamless power conversion to feed a base with 80 employees and a hospitality area (the Waka (1) from the Rugby World Cup 2011).

Bishman's Project Manager, Sean Nelson commented about the SFCs advantages, regarding operational cost and delivery time to San Francisco, "It was the only sensible solution

that was highly reliable, was available in time and was cost effective". Another unique feature critical to the reliability of the converted output supply is the built-in redundancy capability which is an intrinsic feature of the modular system design. In an unlikely event where either a single rectifier or inverter module encounters a fault, and stops functioning, the master controller that oversees the power modules will provide a warning notification but will allow the system to continue to operate until maintenance can be scheduled. With a campaign budget of over 100 million, it was essential that reliability of the PCS100 SFC operating 24/7 in a foreign base would prevail.

ETNZ has become a household name in New Zealand following their consecutive wins in the America's Cup in 1995 and 2000. In doing this, they became the first team from a country outside the United States to win and then defend the America's Cup. Their successes in America's Cup competitions have contributed to New Zealand's reputation for producing world-class boat designers and sailors. Watch the excitement of the countdown to the America's Cup, summer of racing.

(1) Waka: Canoes of the Maori of New Zealand.

For further information please visit:
www.abb.com/converters-inverters
 (Converters for grid interconnections)

PCS100 power protection products secures more big orders

ABB's PCS100 Active Voltage Conditioner (AVC) and Industrial UPS (UPS-I) are protecting industry applications from voltage sags and swells. To date, ABB's PCS100 power protection portfolio has supplied over 700 MVA to protect some of the world's leading organizations. Covering applications from computer rooms through to large data centers and complete industrial plant protection, ABB has the UPS or voltage conditioning technology for every need. From a few kVA to applications of many MVA and a wide range of supply voltages.

ABB has supplied 20 x 900 kVA and 2 x 1500 kVA PCS100 AVCs to SK Hynix, a preeminent player in the memory chip industry. Based in Korea, SK Hynix successfully produces semiconductors that have fuelled growth of the IT industry, not only in Korea but the world over. With a total of 22 PCS100 AVCs protecting the M12 12 inch wafer fabrication line, SK Hynix's facility can run smoothly without any power outages, reducing production loss and increasing turnover.

IT devices like smartphones and tablets become more pervasive as new imaginative and innovative IT products continue to grab imagination and "desires" of consumers. More innovative IT devices such as the smart car, keyboard and surface computers without a mouse, will enlarge the range and demand of the semiconductor. Due to this ever increasing demand, SK Hynix's M12 production line will produce both DRAM and NAND Flash to help cope with the rapidly changing of future markets and to maintain production flexibility. Here, ABB's PCS100 AVCs will provide reliability by operating at an efficiency rate exceeding 98 percent.

ABB and SK Hynix have a past relationship, with SK Hynix using ABB's technology to protect their many production lines from

voltage disturbances including the M11 production line. Now called the M12 production line, it is an extension of the M11 and M8 lines. With the completion of the M12 line, it can produce up to 40,000 of the 300-millimeter wafers on a monthly basis.

Other customer's that ABB has provided PCS100 AVCs to are Toshiba Mobile Display (TDM), one of the leading manufacturers of middle to small sized thin-film transistor liquid crystal modules. In the future, TDM predicts ABB will provide them with power protection technology as highlighted by Mr. Yoshiyuki Iida (TMD's Group Manager, Manufacturing Group, New Clean room Promotion Dept), "We are also looking forward to communicating with your team to exchange technical information on your wide range of portfolio".

Leading industry organizations seek to utilize PCS100 AVCs technology because it is a battery free solution. This leads to less maintenance costs, along with sag and swell protection and continuous voltage regulation.

For further information please visit:

www.abb.com/converters-inverters
(Converters for power protection)

PCS100 UPS-I protecting a leading healthcare supplier in Vietnam, B. Braun

With approximately 47,000 employees in 58 countries, B. Braun, a leading medical supplier, achieved a turnover in 2012 of 5.05 billion euros. To ensure that production at this multi-billion dollar company is not brought to a standstill by power failures, voltage sags and other electrical disruptions, B. Braun in Vietnam selected ABB to provide a power protection solution. ABB's 1500 kVA PCS100 UPS-I coupled with a 1200 kVA GenSet was selected to protect B. Braun's production line.

B. Braun supplies the global healthcare market with products for anesthesia, intensive medicine, cardiology, extra corporeal blood treatment and surgery, as well as services for hospitals, general practitioners and the homecare sector. The 99 percent efficiency rating PCS100 UPS-I will allow B. Braun's process load to ride through any common power problems, such as a trip in the power supply to equipment (especially during the rainy season affecting their production and product quality). By achieving this, it will increase yield, reduce product wastage and improve productivity.

Space was taken into consideration when choosing ABB's solution. The PCS100 UPS-I provides a compact 1500 kVA design compared to other solutions that offer only 1500 kVA by paralleling three units of 500 kVA. This results in increased investment, with regards to cabling, installation and configuration costs.

Among the many differentiating features of the PCS100 UPS-I, the solution for healthcare applications are:

- Short payback time, typically less than 12–18 months
- Ultra-fast transfer time of less than 2 milliseconds
- Exceptionally small footprint – 50 percent smaller than competing solutions
- Long and more economical operating life – 15 years compared to the three to five years of UPS batteries

Watch ABB's video on [PCS100 UPS-I technology](#)

For further information please visit:

www.abb.com/converters-inverters
(Converters for power protection)

ABB's PCS100 – innovation in power protection

PCS100 AVC (Active Voltage Conditioner)

- Protects sensitive loads from the most common disturbances in utility supplies
- Sags, surges, unbalance, flicker and poor regulation are corrected within a few milliseconds
- Rated 160 kVA - 30 MVA
- High power and performance inverter-based system
- Operating efficiency 97 to 99 percent (model dependent)
- Very small footprint due to no storage to operate

PCS100 UPS-I (Industrial UPS)

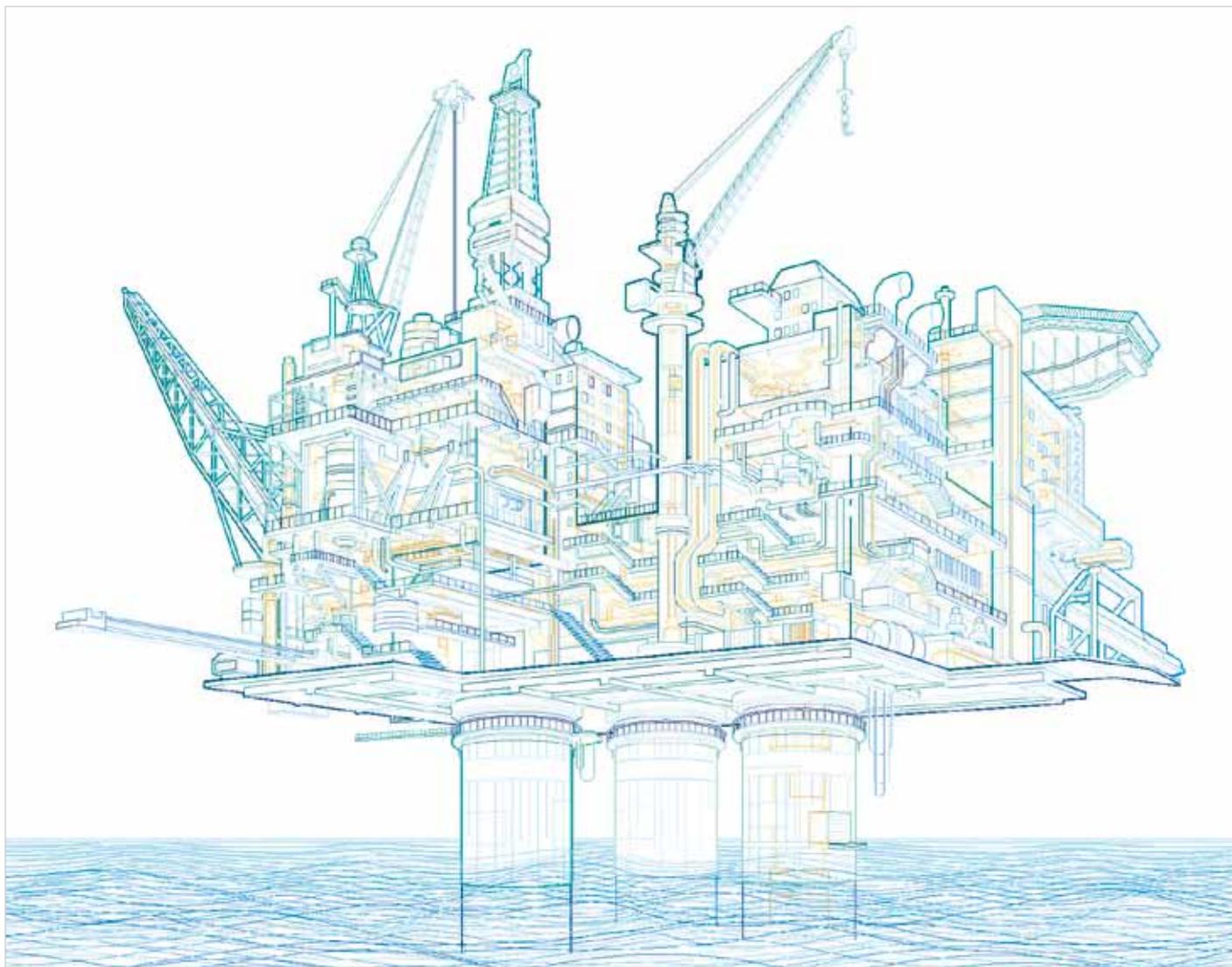
- The PCS100 UPS-I is the ideal solution where very deep sags or short term power outages are a problem
- The PCS100 UPS-I uses energy storage coupled through an inverter to allow the downstream load to ride through very deep sags and short term outages
- The PCS100 UPS-I is an offline system. It is inactive unless the voltage increases by 10 percent or falls by 10 to 13 percent. This enables it to be very efficient, up to 99 percent



PCS100 RPC (Reactive Power Conditioner)

- ABB's PCS100 RPC is specifically designed to condition the current drawn by industrial and commercial loads. The PCS100 RPC uses leading-edge power electronic conversion to inject current into supply, correcting for common problems such as:
 - Unbalanced load current
 - Fast varying current causing voltage flicker
 - Low order harmonic currents
 - Power factor problems including leading power factor
 - Load current induced voltage drop
- As a purely static device, the PCS100 RPC provides extremely fast correction. Its modular redundant design makes it a very reliable, scalable and serviceable product, backed by ABB's global support network. Packed with new features to suit industrial and commercial applications.

For more information, please visit www.abb.com/converters-inverters or contact perry.field@nz.abb.com
Click [here](#) to view ABB's power protection brochure.



Offshore oil platform success

A milestone success for ABB uninterruptible power supplies.

In 2012, ABB, together with ADC Power Concept Sdn Bhd, completed a significant order with Petronas, Malaysia, for delivery of uninterruptible power supplies to an offshore oil platform.

Assurance of power supply is important in many industrial settings, but on an offshore oil platform, it is absolutely crucial. For this reason Petronas sought an alternative to the less reliable traditional, industrial-grade, floor-standing UPS systems. They recognized that the UPS should be field-proven, highly customizable and reliable. It should also eliminate switchover downtime.

Because the offshore environment can be very harsh and remote, the UPS also had to be rugged, with high availability and reliability, and repair and maintenance should be easily accomplished by non-experts.

For these reasons, and after extensive product comparisons, Petronas chose one set of ABB 4 x 40 kVA DPA modular online-swappable UPS and two sets of ABB 3 x 30 kVA DPA modular online-swappable UPS. The delivery included an external input transformer, an external battery charger, an IP 31 protected rating cabinet and the capability of charging a NICD battery set, to provide a long back-up time.

The flexible design of the DPA UPS provides a “pay-as-you-grow” model, ideal in situations where requirements may change with time. This scalability means that there is no need to over-specify the original configuration as power modules can simply be added, as needed, without any footprint penalty. Servicing is easy as modules can be replaced without powering down. The UPS are based on ABB’s unique and proven Decentralized Parallel Architecture (DPA™). With DPA, each UPS module contains all the hardware and software required for full system operation. Modules share no common components, and, as a result, system uptime is maximized.

The footprint of the DPA UPS is very small – a bonus in the offshore world where real estate is scarce and expensive. Comprehensive supply, installation, testing and commissioning was included in the order.

As this is a completely new product configuration with no proven record on offshore platforms, a gradual product assessment policy was pursued. A few systems were installed in a Petronas plant and in a crude oil storage facility so that an assessment based on the onshore environment could be carried out. Also, a detailed factory audit was carried out at ABB Newave, Switzerland prior to the confirmation of the order. The delivery project was completed in October 2012.

About Petronas

Petronas, short for PetroliaM Nasional Bhd, is Malaysia’s national petroleum corporation. It was established on August 17, 1974.

Since its incorporation, Petronas has grown to be an integrated international oil and gas company with business interests in 35 countries. The Petronas Group comprised 93 wholly-owned subsidiaries, 19 partly-owned outfits and 55 associated companies.

A Fortune 500 corporation, Petronas is engaged in a wide spectrum of petroleum activities, including upstream exploration and production of oil and gas to downstream oil refining; marketing and



distribution of petroleum products; trading; gas processing and liquefaction; gas transmission pipeline network operations; marketing of liquefied natural gas; petrochemical manufacturing and marketing; shipping; automotive engineering; and property investment

To see further technology information please visit:

www.abb.com/UPS





Rail industry technology

Railway UPS
supporting 50 Hz
and 16.67 Hz.

ABB's wide range of uninterruptible power supply (UPS) systems are an established part of various rail networks and metro systems around the world, ensuring the reliability, stability and continuity of power for railway applications. ABB's railway power protection solutions include various applications ranging from 10 KW to 5 MW.

Comprehensive power protection solutions for railway applications.

The rail network poses a particular challenge in that often two separate power schemes have to be catered for, e.g., 16.67 Hz single-phase and 50 Hz three-phase. ABB dual-frequency UPS systems are designed for this task and they benefit from a simple design derived from standard parts, eliminating the need for expensive customization.

Typically, ETCS power supplies are fed from a 400 Vrms, 50 Hz three phase network with a diesel electric generator functioning as a backup supply. The diesel electric generator has a significant impact on the entire system installation cost and, because it takes up considerable space, on the system power density.

ABB's solution not only aims to remove the backup diesel electric generator (and associated greenhouse emissions and noise), but also to increase the level of redundancy by adding a battery pack. Where an independent second mains network, for example, 230 Vrms/16.67 Hz single-phase, is available, it can also be used in the backup power scheme. An ABB dual-frequency UPS converter makes it possible to harness both networks, so the load can utilize either, or both, as appropriate. For example, if the 50 Hz three-phase line were to develop a fault, the dual-frequency UPS would feed the critical load via the single-phase 16.67 Hz line, and vice versa.

In the event of a fault on both independent networks, the third energy storage option, the UPS battery pack, would provide the energy requested by, say, a control system like ETCS, thus guaranteeing zero downtime for the entire system.

Dual Frequency UPS Systems Solutions – Key Features

ABB's UPS systems, based on true online double conversion, are fully modular, decentralized and online swappable. They offer the following competitive advantages:

- 99.9999 percent availability
- Efficiency of up to 96 percent in double-conversion mode

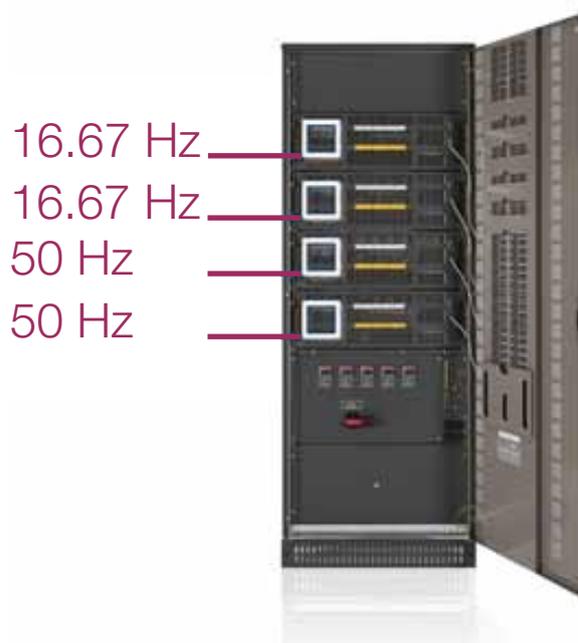
Furthermore, the fully modular and decentralized approach enhances serviceability:

- 20 min MTTR (mean time to repair).
- Optimized spare parts management (the interchangeable module approach radically reduces spare part count and simplifies servicing).
- No downtime: online swap ability allows the modules to be changed while the protection system is up and running.

Doing something special with standard products

ABB offer the best and latest technologies to meet all specific customer requirements. Further, these requirements are met using standard and proven ABB solutions, whenever feasible. This results in a cost-effective project proposal that seeks to ensure reasonable procurement costs, low operating and maintenance costs, minimized inventory and simplicity of operation for railway personnel.

Many customers have adopted ABB's UPS solutions. In a recent implementation for the Swiss state railway, ABB used a standard modular product equipped with two module slots, one compatible with a 16.67 Hz infeed and one with a 50 Hz infeed.



The batteries, able to operate autonomously for more than 30 minutes, and the isolating transformer were integrated into the UPS cabinets, thus saving cost and valuable space. The batteries can be configured as one contiguous unit or as two separate units, one for each module. During normal operation, the load is split evenly between the two supply networks. Should the power supply of one of the modules move out of the tolerance zone, the battery will for the appropriate module will activate. If one module is defective, the other module will take on 100 percent of the load. If the power to both infeeds should fail, the modules switch to battery operation.

This particular project was delivered as an integrated total solution. It included all aspects of consulting and planning, construction and comprehensive testing of prototypes, logistics, service, installation at over 300 locations and supervision of commissioning.

This type of project highlights ABB's ability to provide the power protection solutions needed to supply reliable power and increase power management flexibility in the transportation industry.

To see further technology information please visit: www.abb.com/UPS





Mountainous Engineering

ABB in the world's highest solar power plant.

Three-thousand meters above sea level, on mountainous Pegunungan Bintang, Oksibil, Papua, Indonesia, ABB's PCS100 Energy Storage System (ESS) in a solar power plant (the world's highest, in fact) has radically changed community life.



A remote location

Oksibil is a remote regency located in Papua province, Indonesia. The limited infrastructure and mountainous landscape have made the area only accessible by aeroplane. The area has been relying only on a single diesel power plant to generate power. However, it was costly and challenging to ensure the reliable supply of diesel.

PT PLN (Persero), a government-owned electricity company, decided to build an off-grid solar power plant. With 1,280 solar modules, the plant has a 300 kWp capacity. ABB took pride to support this project by supplying:

ABB's solar solution

- One unit PCS100 ESS with four modules inside and maximum capacity of 315 kVA; The main function of PCS100 ESS is to perform automatic energy storage management system. The batteries are used to store excessive electrical power generated from PV modules during day time to be distributed during night time, or whenever required. The PCS100 ESS converts DC voltage of the batteries storage into AC voltage of the distribution grid (discharging mode) and also from AC voltage of the distribution grid into DC voltage of the battery storage (charging mode).

- One unit of 500 kVA dry type coupling transformer; The coupling transformer is the

interface between 315 V output of PCS100 ESS and 380 V distribution grid voltage.

- One unit AC500 PLC - PM573: complete with HMI display CT430. The PLC acts as remote monitoring and automatic coordination control between PCS100 ESS and the back-up diesel generator.

Ferdinand Sibarani, Sales Engineer of ABB Power Electronics said, "This simple yet reliable system operation has significantly reduced power generation cost by minimizing the solar fuel consumption for diesel generator. ABB delivers high quality power in terms of voltage, frequency, as well as harmonic content".

Additionally, he explained, "The PCS100 ESS has built-in web server so that its performance can be easily monitored using any web browser via LAN (Ethernet) as well as Internet. This feature helps a lot for monitoring".

First commissioning was done in May 2012, followed by the second commissioning on early October 2012. The solar power plant operation started on 24 October 2012.

ABB's technology

Based on a low-voltage converter platform, the PCS100 ESS provides wide bandwidth performance with a flexible and highly modular power electronic configuration. New energy storage devices such as the latest generation batteries, flywheel and super

capacitors enable energy from the electrical grid to be stored and later returned as needed.

ABB offers innovative products for energy storage systems to support the increasing demand for highly efficient energy storage, renewable power integration and grid stabilization solutions. ABB's energy storage systems product portfolio highlights the ever growing demand for energy storage products, which empower industries to manage electrical grids and renewable energy sources more efficiently. ABB's tailor-made solutions for energy storage systems meet these requirements, providing high return on investment, minimal environmental impact and the required technology for smart grids.

For further information please visit:

www.abb.com/converters-inverters
(Converters for energy storage and grid stabilization)

Watch ABB has over a decade of expertise in implementing energy storage systems





Oberaar dam (picture: KOW/Robert Boesch)

Powering up

ABB commissions world's largest frequency converter to be used in pumped storage power plant.

In 2010, ABB received the order to supply a 100 MVA PCS 8000 frequency converter system to KWO, Kraftwerke Oberhasli AG, one of the leading hydroelectric power companies in Switzerland. The PCS 8000 frequency converter system is now commissioned and in commercial operation.



ABB has installed the world's largest frequency converter for a variable speed pumped storage application at Grimsel 2, one of nine hydro storage power plants owned and operated by Switzerland's hydroelectric power company, KWO.

The 100 MVA frequency converter, PCS 8000, is fitted to one of four, 90 MW synchronous generator/motor sets used at Grimsel 2. Each set has a separate Francis turbine and pump on the same shaft to either generate electricity or pump water. Using surplus electricity, water is pumped from the Grimsel lower reservoir into the higher Oberaar lake where it is stored, before being used to produce electricity during periods of high electrical demand.

By upgrading one of the generator/motor sets from fixed speed to variable speed, the synchronous machine now operates between 600 and 765 rpm in pump mode, using up to max. 94 MW of absorbed power. For certain operations, the

converter system can be by-passed and run in its original mode at fixed speed.

This arrangement overcomes limitations of the previous design, whereby control energy could only be achieved in turbine operation as the four pumps were powered by fixed-speed motors. This led to a loss of stored water in the reservoir especially during low water inflow and low-load periods.

By using the variable speed option, the reservoir water can be used to generate valuable peak load electric power instead of being consumed for energy control. This results in higher operating profitability. The upgraded machine group can now be operated in the following modes:

1. Pump operation with converter (at variable speed)
2. Turbine operation with converter by-pass
3. Pump operation with converter by-pass (at constant speed)
4. Reactive power control with grid side converter

Successful commissioning

ABB's system consists of the PCS 8000 frequency converter with AC 800PEC control unit and ABB transformers for grid and machine side. ABB provided system and control engineering, installation and commissioning of the frequency converter.

Commissioning of the PCS 8000 converter system was completed in April 2013, setting a new milestone in the development of variable-speed operation for pumped storage plants of this capacity.

KWO is one of the leading hydroelectric companies in Switzerland, producing an average of 2,350 gigawatt hours of electrical energy per year – about seven percent of Switzerland's hydroelectricity production; enough energy for one million people.

For further information please visit:

www.abb.com/converters-inverters

1 One 90 MW machine group comprising generator motor, Francis turbine and pump | 2 PCS 8000 frequency converter | 3 PCS 8000 cooling system | 4 Transformer

Hannover Messe - ABB showcase their PCS100 power protection portfolio



Hannover Messe, attracting around 250,000 visitors per year, is the world's leading trade fair for industrial technology. This year in April, ABB featured its power protection range, highlighting the features and benefits for industries and applications.

ABB's previous power protection range based on the PCS100 platform included the Active Voltage Conditioner (AVC), Industrial UPS (UPS-I) and Reactive Power Conditioner (RPC). The portfolio has now been complemented with the acquisition of the innovative uninterruptible power supply (UPS) company, Newave Energy, based in Switzerland. ABB is now able to offer a complete range of commercial and industrial UPS products that suits all flexibility, availability and power needs. This combination closed the product gap in core datacenter electrification and industrial power quality. Although ABB has a strong presence in industrial markets, already offering the single conversion PCS100 UPS-I, Newave is active in the dual conversion UPS range.

The power protection portfolio proved very successful at the Hannover Messe, attracting new customers who were interested in how their process equipment can be protected from power sags and surges. With the whole range now being CE certified, this demonstrates compliance with the relevant European Union safety directives. This increases credibility of ABB's products, increasing customers confidence and thus building long-term relationships on an international scale. ABB's comprehensive power protection



range offers endless amounts of advantages including; high reliability with efficiency ratings exceeding the high 90 percent range, small footprint in design saving valuable floor space, and various designs that can scale with your business to maximize availability, that is suited for commercial and industrial purposes.

To read more on ABB's power protection portfolio, please visit: www.abb.com/converters-inverters or www.abb.com/UPS

ABB Automation World in Beijing - May 24th – 25th 2013



ABB Automation World 2013 was held in Beijing on May 24th – 25th, and featured the PCS100 AVC. Three technical seminars were held to introduce PCS100 products and their applications.

This year's event attracted more than 3000 customers, nearly a 20 percent increase compared to 2012. Sales representatives and engineers introduced the PCS100 AVC features as well as successful applications in China to date.

Urs Waelchli, Power Protection Profit Center Director of ABB's Beijing Drives team, spoke about general ABB power protection products, among which, PCS100 was an important part. Another seminar outlined ABB's power protection solutions with the PCS100 AVC as a core component, introduced how PCS100 AVC protects important production equipment and control systems from voltage sags for auto manufacturers.

ABB's PCS100 AVC is currently in operation in a leading auto manufacturing company based in Changchun, to help eliminate the risk of production loss caused by voltage sags. ABB's PCS100 Energy Storage System (ESS) was introduced in a third seminar. Earlier this year, ABB supplied a 2-megawatt (MW) capacity Lithium-ion (Li-ion) battery storage system to a leading provider of grid level energy storage system solutions. This was the first MW-class for ABB PCS100 ESS in China.

To read more on ABB's PCS100 technology, please visit:
www.abb.com/converters-inverters



PCS100 Product training 2013

Register your interest now for 13-15 August 2013



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 2013

| Course | Day one | Day two | Day three |
|-----------------------|----------------------------------|-----------------------------|---------------------------------|
| Three | 13 August | 14 August | 15 August |
| Four | 12 November | 13 November | 14 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 2013

Register your interest now for 20-22 August 2013

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 organized 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 2013

| Course | Day one | Day two | Day three |
|-----------------------|--------------------------------------|-------------------------------------|-------------------------------------|
| Three | 20 August | 21 August | 22 August |
| Four | 19 November | 20 November | 21 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 |

Powering the digital age



Power protection

6. Smart technology

ABB provides leading edge technology to electronics manufacturer

7. Mega protection

PCS100 UPS-I protects the front end process of memory chip production

8. Datacenter power

ABB supplies six Conceptpower DPA units to Zurich

Industry watch

12. Grid stability reaching new limits

ABB and Prudent Energy work together to provide grid stability

Project completion

15. PCS 6000 setting new efficiency records

Efficiency at its best

Seamless power



Power protection

6. The power of water

Wöhrl system solution based on ABB UPS for wastewater business

11. Smart technology

ABB's PCS100 UPS-I protects Samsung's mega-investment in China

Grid interconnection

13. Onshore engineering

PCS100 frequency converters for ship building and ship repair activities

Industry watch

15. Steel industry

ABB's high quality PCS100 STATCOM provides a robust solution that improves power quality to the steel plant

16. Vyksa Steel Works

PCS100 STATCOM providing a turn-key solution for Vyksa metallurgical plant in Russia



Power protection you can rely on?

Certainly.



By choosing from ABB's PCS100 AVC, RPC and UPS-I solutions, you are selecting from a unique lineup of advanced technologies and expertise. This low voltage power protection product range provides energy efficiency, high reliability and increased productivity. These unique systems give superior value to operations in the industrial, utility and commercial sectors.

www.abb.com/powerquality

Power and productivity
for a better world™

