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contact

The customer magazine
of ABB in India,
Middle East & Africa

Energy efficiency – doing more with less

Power and productivity
for a better world™

contact 1|13

Carlos Pone
Country Manager and Chief Executive Officer ABB in Southern Gulf and Pakistan

Dear friends,
I am delighted to be writing to you in my new capacity as CEO of ABB in Southern Gulf (UAE, Qatar, Oman) and Pakistan. I am looking forward to applying my experience of nearly 20 years with ABB, the last 14 of those as CEO of ABB in South Africa and Southern Africa, for the benefit of our customers in the region. I hope to be meeting many of you in the near future and I look forward to learning more about your challenges and opportunities.

Talking of years and experience, did you know that ABB has been in the energy business for over 120 years! Our technologies are used along the entire energy value chain, from the extraction of resources and their transformation into electricity, liquefied natural gas or refined petroleum products, to their efficient use in industry, transportation and buildings. Our optimization solutions, network management solutions, high voltage DC transmission and flexible AC transmission are some examples. Our high-efficiency motors, drives, control systems, energy management systems, lighting solutions, turbochargers and charging solutions all make energy go much further.

In this issue of Contact we have for you, interesting news and views on the hot topic of energy efficiency – doing the same amount of work with less energy, or doing more work with the same amount of energy – our aim is to help our customers squeeze the most value from each unit of energy they use.

Welcome to the world of energy efficiency – the alternative fuel!

Best regards,

Carlos Pone

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News

Energy efficiency

For a better world

Product news

In focus

Expanding the Saudi power grid

Orders, worth around $170 million, were booked to execute substation projects for the Saudi Electricity Company (SEC), the country's national power transmission and distribution operator.

The design, supply, installation and commissioning of a substation will help meet the increased demand for electricity in and around the central pilgrimage area of Makkah, which hosts millions of the faithful every year. The substation deploys our compact and robust gas-insulated switchgear (GIS) technology, and will be accommodated in a multi-storied building. Its considerably smaller footprint is ideally suited to tight spaces.

International Monetary Fund (IMF) estimates population increase from 28 million to approximately 37 million by 2020, with nearly 85 percent living in urban areas. Saudi Arabia has among the highest residential electricity consumption in the world. The country is executing an ambitious Ninth Development Plan (2010-2014) aimed at raising its installed power generation capacity by more than 20 gigawatts (GW) to reach around 72 GW by 2014.

For more information: www.abb.com/substations

World-class learning zone opens in Middle East

The learning zone, based in the iconic HQ building in Abu Dhabi, United Arab Emirates (UAE) is set over 1,000 square meters and showcases ABB's products, services and solutions. H E Sheikh Nahyan Bin Mubarak Al Nahyan, Minister of Higher Education and Scientific Research formally opened the center.

"This facility provides a special environment for customers and other key stakeholders from across the Middle East. They can choose from 180 courses led by knowledgeable employees across multiple disciplines and products," said Frank Duggan, Head of Global Markets and Region Manager for ABB in India, Middle East and Africa.

The facility will be used by Emiratis and other stakeholders, bringing knowledge and expertise under one roof and demonstrating our commitment to securing deep roots and investment in the UAE's future.

"On completion of courses, engineers and operators will gain valuable knowledge, which will in turn improve effectiveness and efficiency, helping customers to increase productivity, efficiency and safety of their processes," said Frank Duggan.

To book courses call training center manager, Jalal Jihazi, 00971 24938562

For more information: www.abb.com/abbuniversity

In brief

Improving grid reliability in Oman

An electricity distribution company has awarded ABB a contract worth $7million to improve the availability and quality of electricity. The contract from Mazoon includes a Network Manager SCADA system, 90 outdoor multiple remote terminal units (RTUs) on a turnkey basis. Interfaces for 33/11 kV substations and the supervisory control and data acquisition system (SCADA) are included to control and monitor electricity supplies. SCADA will cover the South Batinah, Dakhliyah and Sharqiyah governorates.

Riding the metro

On his visit to India, Group CEO, Joe Hogan caught a ride in the pride of Bangalore, the newly started metro service from MG Road to Byapanahalli. Earlier this year, the Bangalore Metro project team from ABB received an award from BMRCL for successfully completing one million safe man-hours.

Investing in India

To help customers access technology at more competitive prices, ABB is investing in local production of gas-insulated (GIS) and hybrid switchgear (PASS), and distribution transformers in Gujarat. The facility will be operational in 2013.

Solar technology displayed at industry forum

Within six hours, the earth receives more energy from the sun than humankind consumes within a year, according to the Desertec Foundation. Determined to turn this latent potential into the Middle East's energetic future, ABB presented its innovative solar technology at the Arabian Power and Water Forum (APWF) in Dubai, United Arab Emirates (UAE.)

Key government and industry figures met to discuss and generate strategies crucial in the development of a sustainable water-energy balance. Concentrated Solar Power (CSP) and Photovoltaic (PV) both display efficiency leadership for high Direct Normal Irradiation (DNI) regions.

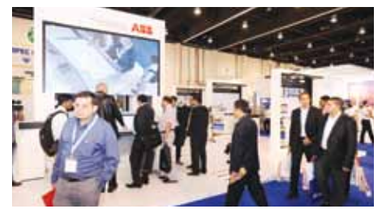
PV solutions directly convert solar power to electricity at a maximum yield throughout the day and at all levels of global irradiation. Ramesh Trikkadi, sales and marketing manager, renewables, Power Generation and Water Utilities, UAE, spoke about dedicated solar solutions. "As one of the pioneers of the PV industry, ABB has extensive and thorough global expertise, providing competitive solutions. This has enabled the development of increasingly efficient and constantly optimized integrated solutions and also an exhaustive portfolio diversification," he said.

For more information: www.abb.com/solar

Energy efficiency displayed at ADIPEC

The latest ABB technology available for the oil and gas industry was on show at the Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) in the United Arab Emirates (UAE.) The products displayed can save costs and boost asset performance by 6 percent.

Our technology is used across the entire oil and gas value chain, serving exploration, production, marine supply, transport and support functions. The display included the Static Var Compensator (SVC), active filters, platform electrification, AC500 PLC, ACS800-38 low harmonic drives and ACS800 drives, ACS2000 MV drives, synchronous reluctance motor, the arc guard system and the interactive collaboration table.



"We are committed to the oil and gas industry and demonstrated its key technology and capabilities. Extending asset life and reducing operational expenditure is key to any industry – assets not performing at their peak consume more energy and require more expenditure," said Bjarne Andre Asheim, regional manager, Oil, Gas and Petrochemical, Middle East.

For more information: www.abb.com/oilandgas

Why energy efficiency?

Using energy more efficiently is critical to business and national competitiveness. It's also the fastest, most effective way to protect our environment by breaking the link between economic development and climate change.

We have been in the energy business for over 120 years and ABB technologies are used along the entire energy value chain, from the extraction of resources and their transformation into electricity, liquefied natural gas or refined petroleum products, to their efficient end use in industry, transportation and buildings.

Utilities

Power generation is by far the largest energy consuming industry. The efficiency varies widely with the fuel and technology used: in traditional coal-fired plants, only about 35 percent of fuel consumed is converted into electricity.

In addition to high conversion losses, power plants consume on average, 5 percent of the electricity they generate. Using sophisticated control systems and energy-efficient equipment can reduce energy consumption by 10 to 30 percent.

We also address thermal energy efficiency of boilers – by automating their future efficiency, one chemical plant was able to realize $300,000 in energy savings across four boilers, as well as improved performance, from a $75,000 investment.

Nine percent of all the electricity generated worldwide is lost in transmission and distribution. Flexible AC transmission systems (FACTS) enable more power to travel over existing networks, which is critical in dense urban areas.

And, ABB high voltage direct current (HVDC) electrical transmission and high-efficiency power and distribution transformers reduce power losses over great distances. This can help integrate renewable energy from remote locations into the grid, or to bring reliable electricity to remote mines or offshore platforms.

Industry

Just six process industries account for two-thirds of the global final energy consumption: iron and steel, oil and gas, chemical and petrochemicals, non-metallic minerals, pulp and paper, and non-ferrous metals. Despite significant improvements through energy efficiency, there is still room for ways, which complement rather than change production processes in energy-intensive industries.

We help customers improve efficiency in two ways:

1) Through leading technologies: In 2011, the global installed base of ABB variable speed drives saved some 310 million megawatt-hours of electricity, the equivalent of the annual power consumption of 75 million EU households.

2) Through our experts, who help customers understand where and how they use energy, and then identify and implement opportunities for improvement. Over ten years of experience in many industries, we have learned that energy savings of 5 to 35 percent can often be created.

Mechanical hoist drum at Totten mine, Sudbury, Ontario, Canada – equipped with energy-efficient drives from ABB

Improving energy efficiency has the clearest impact on saving money, improving business results, and delivering more services for consumers. The UN global initiative on Sustainable Energy for All

Transportation

Innovations for shipping

Around 90 percent of world trade is carried by some 70,000 vessels that make up the international shipping industry. Fuel accounts for 30-40 percent of the cost of running a cruise ship and between 50-60 percent for most merchant vessels. ABB's Azipod®, the world's first rotating propulsion device, fitted to the outside of a ship's hull, is now installed on half of all cruise liners built over the past two decades, reducing energy consumption of open-water vessels by 5 to 15 percent.

ABB's experts have worked on some 3,000 marine automation and control systems around the world, which are

Dual hoist ship-to-shore cranes – Busan, South Korea

supported and maintained by experts at 22 marine service centers.

We are also developing a complete suite of software products, known as Smart Marine Integration (SMI), to monitor, control and optimize every energy consumption process during vessel operation. Some components of it are already available and Finland-based Viking Line, has selected ABB's energy management system for a new ultra-energy-efficient passenger vessel that will have almost zero GHG emissions.

Keeping rail energy usage on track

Rail is seeing renewed interest as a sustainable and energy-efficient form of transport, capable of reducing congestion, emissions and noise.

We supply components for both rail infrastructure and rolling stock, and are one of very few independent suppliers to offer a complete traction package to rolling stock manufacturers. We have solutions to transfer power efficiently from grids to railways. Our regenerative braking systems capture and store energy that would otherwise be lost, and high-efficiency turbochargers boost the performance of diesel engines.

In just 13 months we developed a new traction converter to refurbish the first fleet of high-speed InterCityExpress trains operated by Deutsche Bahn, Germany's national rail operator, cutting energy by at least 12 percent. This is the first project worldwide involving the exchange of high-speed train converters while leaving all other components of the traction chain and all interfaces unchanged.

Buildings

By 2050 there will be 4.5 billion people in cities around the world, creating an urgent need for infrastructure. Old buildings offer room for improvement, while modern buildings house energy-intensive data centers and sophisticated air conditioning systems.

ABB's intelligent building control system, based on the KNX global open standard, is increasing efficiency in thousands of new and existing buildings in more than 60 countries, enabling customers to reduce energy consumption by about 50 percent, with a payback period of between one and five years. Three ABB i-bus® KNX-equipped buildings in Singapore, including the region headquarters of Xilinx, Applied Materials Inc, and the Singapore National Library, have won prestigious BCA Green Mark Platinum awards from the Building and Construction Authority for their energy efficiency.

Annual consumption for heating and ventilation can be cut by as much as 45 percent using very simple methods, such as individual room temperature control, combined with moderately reducing the room temperature, or heating control based on the outdoor temperature.

High-efficiency motors and the alternating current (AC) drives used to control them offer further efficiencies as motors consume about 40 percent of a building's electricity, and AC drives can reduce energy consumption in these applications by as much as 80 percent.

Putting it all together

Many technologies that improve energy efficiency are readily available. However, often, the greatest potential for savings often lies in the gaps between production processes and functional silos – manufacturing, facilities management, maintenance and support processes such as electrification, compressed air, steam and water.

For this reason, ABB advocates a holistic approach – understanding where and how energy is used so you can prioritize projects which will bring the greatest business benefits, and then ensuring their successful implementation. This improved 'energy transparency' also helps build the business case for future efficiency investments, creating a process for continuous improvement much like those for quality and operational excellence.

Interview

Energy efficiency as a sustainable, competitive advantage

Jim Kelly, head of ABB's global energy efficiency initiative, discusses the potential and the challenges of energy efficiency.

Why is energy efficiency such a hot topic today?

It's high on the radar of countries and industries alike because energy is increasingly one of our greatest challenges. Security of energy supply is a very real problem, from generation shortfalls to unreliable power quality. Businesses in locations with comparatively high energy prices are finding it more and more difficult to compete in a global marketplace.

At the same time, the world has become intensely aware that we can't continue meeting the challenge of secure, affordable energy only by adding new carbon-based thermal generation capacity. Industrial energy efficiency doesn't command the media attention of solar power or electric cars, but it is a workhorse for tackling climate change.

Are the technologies to create this savings already available?

Yes. There are a slew of automation and power solutions that are well proven. It's not just the technical features – there is ample evidence of the business benefits. Naturally there are cost savings, but in addition, companies who learn to do more while using less energy are more competitive overall and enjoy enhanced reputation.

We've also found that, improving energy efficiency often provides operational benefits. For example, improperly tuned boilers not only waste energy, but they are often unable to respond quickly to changes in steam demand – this can hurt product quality and reduce plant throughput.

So are a lot of companies embracing these technologies?

We see a big disconnect between recognition and action. In an ABB-commissioned global survey of top industrial executives, while about 90 percent acknowledged that energy efficiency will be a critical success factor for their business in the coming decades, only 40 percent had invested in energy efficiency in the past three years and only a third had undertaken a plant-wide energy audit.

How do you account for this gap?

It really comes down to a lack of facts and resources. Many manufacturers simply don't have transparency as to where and how their energy is used, preventing optimization. In addition, other priorities such as quality, productivity and safety improvements also place demands on both human and capital resources resulting in energy efficiency improvements being relegated down the priority list.

This lack of information makes it difficult to build the business case for investment, and for management to have confidence that they will reap the intended savings.

How can companies overcome these obstacles?

More and more we see operating companies turning to partners like ABB who are equally fluent in technology on the plant floor and cash flows in the board room. For example, financing is often a critical hurdle and requires new approaches such as performance-based contracts that will pay for improvements out of operating expenses instead of CAPEX.

These contracts can include guaranteed savings metrics to reduce performance risk. In today's lean operating environment, many manufacturers of course know their processes well, but in many cases don't have the experts to identify and implement energy efficiency improvements themselves. Therefore, to have a partner who can take you through the full cycle of identification, evaluation and implementation can often be the difference between a worthy project sitting dusty on a shelf, or realizing meaningful, sustainable savings.

For more information:
www.abb.com/energyefficiency

ABB's multi-drive system enables 22 percent energy savings in sugar production process

Saving energy at world's largest sugar refinery

A combination of design, engineering and drives boosted production of refined sugar by 1,000 tons per day and helped energy savings by 22 percent.

An upgrade of the design, engineering and supply of ABB variable frequency drives (VFDs) in 2011, substantially increased the production capacity at Al Khaleej Sugar (AKS), in Jebel Ail, Dubai.

Cane sugar granules are melted and concentrated to massecuite, which is separated into fine sugar granules by centrifugal machines. Variable frequency drives with common direct current (DC) bus are the most reliable and efficient control method. They contribute to minimum electrical equipment installations, lowest energy consumption and negligible impact on the power grid.

VFDs control the number of cycles per hour and increase the production capacity by 20 percent. ABB's latest multi-drive and new process performance motors replaced the existing Samistar drive.

Fitted with a non-regenerative drive, the centrifugals have high energy consumption and during braking, produce a lot of energy as heat. Our company adopted regenerative drives, allowing the energy produced during deceleration to be fed back into the supply system.

New technology increases productivity

"Previously the centrifuges were completing 22-24 cycles per hour, but the new technology enables up to 30 cycles per hour. This means we can produce up to 7000 tons per day (TPD), the figure before was 5,000-6,000 TPD. There is also less power lost. Before, the centrifuges consumed 0.952 kilowatt-hours (kWh) per ton of massecuite, which has been reduced quite significantly to 0.75 kWh per ton of massecuite. This equates to a 22 percent energy saving," said L Chenna Krishnan, Deputy General Manager, Refinery, AKS.

Centrifugals were driven by single-speed fixed frequency induction motors, considered inefficient. To increase efficiency, two-speed motors were developed to allow the low speed winding to regenerate from spin to half speed. This recovered 10 percent of the motor energy used during acceleration, spinning, discharging and feeding. Three-speed motors were introduced and subsequent regenerative braking, 20-25 percent of the motor energy used during acceleration was recovered.

Regenerative drives are key

A multi-drive system was designed to meet motoring and regenerative cycle requirements operating 365 days a year. This system comprised three parallel operated Insulated Gate Bipolar Transistor (IGBT) supply units and 14 inverters to run our premium efficiency motors.

A complete drive system was integrated by our channel partner, Blouden Control System from Dubai, UAE – the only partner in the Middle East to integrate the ABB multi-drive system.

For more information:
www.abb.com/energyefficiency

Taking the motor world by storm

ABB's synchronous reluctance motor and drive packages continue to raise interest eleven months after being voted Europe's automation product of the year.

High output SynRM motors (the motor on the right in the image above) provide the same output as traditional induction motors (the motor on the left in the image above) that are up to two frame sizes larger – thus, enabling smaller, lighter and more cost-efficient pump and fan installations.

And, as they provide double the power of an induction motor of the same size, this enables increased flow without the need to mechanically modify the system to accept a larger motor.

High output SynRM motors are also more energy-efficient, with 10-20 percent lower energy losses than those of IE2 induction motors, thus, providing a commercially competitive alternative to traditional and other new motor technologies.

How is all this possible?

"The SynRM integrates the best of two worlds," says Ari Tammi, ABB product manager for motors. "It combines the performance and efficiency of permanent magnet technology with the simplicity, cost-efficiency and service-friendliness of induction motors."

From the outside, the SynRM looks like a conventional induction motor. But on the inside, it is nothing like it, instead it uses an innovative rotor design that has neither magnets nor cage, thus virtually eliminating rotor losses and giving the motor a uniquely cool operating temperature.

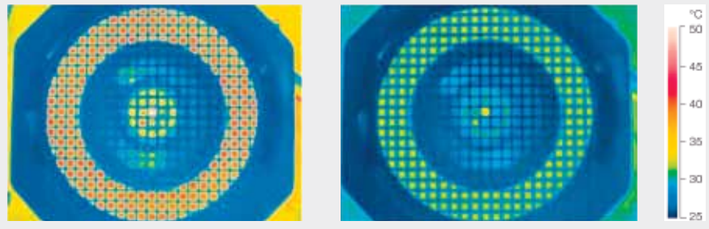
This in turn reduces the temperature of the bearings and extends their service life and maintenance intervals. As about 70 percent of motor failures are related to bearings, the lower bearing temperature can prevent unplanned motor stoppages, thereby increasing motor availability and reliability.

Not surprisingly, the new SynRM has generated major market interest, winning Europe's foremost automation award at the SPS IPC Drives Fair in Germany in November 2011.

"The first SynRM high output motor and drive packages are now available for pump and fan applications," says Linda Stenman, ABB product manager for drives. Later we will see the launch of SynRM packages designed for IE4 super-premium efficiency levels that offer even more choice to variable speed motor users."

For more information: www.abb.com/motors

Temperature scans from a thermal imaging camera



Induction rotor

Synchronous reluctance rotor

Lighting the largest women's university in the world

University lighting solution wins international award

A winning ABB solution for the new Princess Nora Bint Abdul Rahman University in Riyadh, Saudi Arabia, provides energy-efficient lighting and heat protection across an eight-square-kilo meter campus.

The solution was named winner of the KNX Award 2012 in the international category for Asia earlier this year. It is thought to be the largest solution ever to use devices that comply with the global KNX standard for energy-efficient home and building automation control.

Princess Nora University is the largest women's university in the world. The new purpose-built campus opened in January 2011 and accommodates 40,000 students and 12,000 staff. It covers an area of 8 square kilometers and comprises 800 buildings; including classrooms, halls of residence, research centers, recreational and sports facilities, a library, a 700-bed hospital, as well as kindergartens, schools, mosques and its own 10-station, driverless, overhead metro system.

The ABB i-bus® KNX solution enables the university to automatically and remotely control lighting and sun protection systems in each of the 800 buildings using one single interface. A similar i-bus KNX solution controls the lighting in each of the 10 campus metro stations.

With strong sunlight and temperatures of up to 50 degrees Celsius to contend with, sun and heat protection are key features of our solution. Thousands of blinds provide protection from the sun's glare and prevent high levels of solar heat from entering the buildings. The blinds shift automatically according to the position and strength of the sun, or can be adjusted manually, resuming their automatic settings via presence detectors when people leave the room.

Each building is divided into zones with presence- and daylight-dependent lighting control. Classrooms and lecture halls are equipped with dimming and darkness control to facilitate presentations, and large rooms and halls are divided into smaller lighting areas to create ambience and save energy. When no one is present in a room, the climate control system automatically adjusts to eliminate waste of energy, by shutting down air conditioning.

By using lighting control efficiently and by reducing the need for air conditioning with presence detection and effective sun and heat protection, our solution is helping to make Princess Nora University a landmark in energy-efficient building control.

Not only does the i-bus reduce building energy consumption by around 40 percent compared to technologies that do not use the KNX open standard, it has opened the possibility for many of the university buildings to apply for green or gold ratings within the LEED standards (Leadership in Energy and Environmental Design) of the US Green Building Council.

ABB was selected for the project by the two main construction companies that built the university, Saudi Oger and SBG, and the two system integrators subcontracted to install the solution on the construction companies' behalf: MTTS and Honeywell HBS respectively. The KNX award was made to MTTS.

Our i-bus KNX solution for the new Terminal 3 building at Delhi Airport was the previous winner of the biennial KNX Award for 'International Category – Asia' in 2010.

For more information: www.abb.com/knx

Cutting the cost of wastewater treatment

An award-winning ABB MV drive has reduced energy consumption at a US wastewater treatment plant by more than 1 million kilowatt-hours a year.

The ACS 2000 medium voltage variable speed drive was installed in July 2011 and has achieved some remarkable results within its first year of operation at the City of Beloit Water Pollution Control Facility (WPCF) in Wisconsin, United States.

The facility treats an average of 5.5 million gallons (20.8 million liters) of wastewater a day from the city's 37,000 inhabitants, as well as industrial waste from local businesses and biological waste from food processing plants.

Like many wastewater treatment plants, Beloit uses a conventional activated sludge process for treating the wastewater. At the heart of this process are the aeration basins in which microorganisms break down the organic matter in the wastewater. These bacteria require oxygen to survive, which is provided by huge aeration blowers that blow air through diffusers at the bottom of the basin.

Aeration blowers typically account for 50 percent or more of the electricity consumed by a wastewater treatment plant, and Beloit is no exception. Prior to the installation of the ACS 2000, the aeration blower system at Beloit WPCF was controlled by an inlet throttling valve – a common solution for blower control, that operates at fixed speed and does not offer the same operating and cost benefits as variable speed drives.

For Beloit WPCF these benefits are wide-ranging and include soft start capability, ease of installation, direct-to-line (transformer-less) connection to the power supply network, minimal harmonic distortion, non-requirement of medium voltage power factor correction, compact and lightweight footprint, short payback time and low total cost of ownership.

These benefits are enhanced by an ABB DriveMonitor™ intelligent diagnostic system that performs remote and real-time monitoring and diagnostics of the drive via a wall-mounted PC connected to the telephone line.

Once the ACS 2000 was installed, the power consumption of the aeration blower system dropped by more than 30 percent and total plant energy consumption by 15 percent, which is more than 1 million kilowatt-hours (kWh) a year. At an average composite rate of $0.62/kWh, the annual savings for the city of Beloit amount to $75,000.

Sewage water purification tank – Beloit, Wisconsin, USA

For more information: www.abb.com/water

How does ACS 2000 help save more?
Scan to watch the video

Increasing productivity at oil tank farm in UAE

Better overall efficiency of pumps allows for quick oil handling and boosts productivity of Vopak Horizon Fujairah Limited.

The Vopak Horizon tank farm

We expanded our Diode Supply Unit (DSU) based power supply unit with ISU modules to enhance the oil pumping operations at Vopak Horizon Fujairah Limited, a leading storage and handling service provider for petroleum products at the Arabian seaside in the United Arab Emirates (UAE).

Vopak Horizon Fujairah caters to blending, break-bulk and consolidation of petroleum products. Strategically located at the mouth of the Strait of Hormuz on the eastern side of UAE outside the Gulf, the company is the leading storage and handling service provider for petroleum products in Fujairah.

The proximity of the crude oil pipeline that links Habshan oil field in Abu Dhabi to Fujairah underlines the strategic importance of the location at the Strait of Hormuz, the world's most sensitive choke point.

Vopak Horizon Fujairah services include receipt of oil from and delivery to ships, homogenizing, inter-tank transfers and pipeline transfers to neighboring terminals and ship-to-ship transfers. The operation of the tank farm is critical and demands minimum downtime due to high operational costs.

IGBT technology reduces harmonics in the network

ABB has been associated with Vopak Horizon Fujairah since 1998 and has since then ensured the reliable operation of 50 pumps at the tank farm by a complete, engineered multi-drive solution along with non-sparking motors and Programmable Logic Controllers (PLC) for the process control.

Through our leading-edge drives technology, the customer increased productivity and efficiency of the pumps. The latest ISU (Insulated gate bipolar transistor – IGBT) based supply units were added to the existing DSU. The expansion enabled the terminal to operate more pumps on demand with a total power consumption capacity of 8.7 megawatts (MW). Earlier, this was limited to 3 MW with diode supply units.

The IGBT-based system helps to reduce the system harmonics level from 30 percent to 4 percent. This eliminates distortion in the electricity network and improves the power factor near to unity, which improves system stability and efficiency.

"We rely on IGBT technology to improve the overall efficiency of our pumps since the demand for quick oil handling and continuously increasing the pace of productivity is essential for the success of our business. We doubled the capacity of an existing substation using ABB drives, enabling an improved productivity of the connected pumping station," says Christiaan van Nielen, Terminal Manager, Vopak Horizon Fujairah.

Preventive maintenance reduces costs

Furthermore, the scope of supply includes a preventive maintenance contract consisting of periodical preventive maintenance checks, availability of 24/7 emergency call center service, training, reconditioning and repair services, legacy product support and parts management support. With a preventive maintenance contract, the risk of interruptions in plant productivity and maintenance costs are minimized, which contributes to the overall increase in the uptime of the oil pumping infrastructure.

For more information:
www.abb.com/energyefficiency

Water flow meter wins industry award

ABB has been recognized at the 2012 H_2O awards for its AquaMaster3™ device that helps address water leaks, boost water efficiency and lower utilities' environmental impact.

The AquaMaster3 won 'Most water-efficient' product

The H_2O awards celebrate outstanding achievements of the Middle East and North Africa (MENA) water industry and were held in Dubai, United Arab Emirates (UAE.) TheAquaMaster3 technology won the 'Most water-efficient' product category.

The device marks a new era in water leakage management and was designed in response to the industry's stringent demands for enhanced metering capability. The flow meter delivers measurement data from remote locations directly to customers via the Internet to a PC or mobile device – enabling action to be taken quickly.

Technology reduces environmental impact

The meter sets the standard for remote potable water measurement and delivers the best-in-class technology with essential operational and financial benefits. Measuring potable water is challenging due to measurement inaccuracies, costly chamber construction, flow interruptions, suspect product reliability, expensive installation, commissioning and maintenance – all further compounded by poor leak prevention.

Sivakumar Subramanian, ABB's global market development manager for Water in India, Middle East and Africa, said: "We are delighted to win this prestigious award which has set an exemplary standard for remote potable water measurement, delivering best-in-class technology combined with essential operational and financial benefits to the industry."

We provide the most economical and advanced instrumentation technologies for improvement of water efficiency and quality. "At the same time, ABB is taking giant leaps forward by embedding seamless, smart integration with renewable power, utility information technology systems and communication technologies," added Sivakumar Subramanian.

Reducing customer costs

Additional benefits include no need for routine maintenance, lower installation costs and meter accuracy that will not deteriorate through wear. Our long-standing commitment to the water industry and the recent recognition, were followed by a global leadership award by Frost & Sullivan for innovation in the sector of 'smart water networks/grids.'

With several decades of global water and wastewater knowledge in applications ranging from pumping stations, desalination, treatment, distribution and the management of the entire water-wastewater cycle in municipal and industrial customers, ABB is the preferred partner to the entire industry, providing comprehensive portfolios of electrical, control and automation technologies, in addition to industry-specific turnkey solutions and life cycle services.

For more information: www.abb.com/water

ABB solves 100 year old electrical engineering puzzle

Development of a DC breaker for high voltage transmission will help shape the grid of the future.

Recently, ABB announced a breakthrough in the ability to interrupt direct current, solving a 100-year-old electrical engineering puzzle and paving the way for a more efficient and reliable electricity supply system.

After years of research, we have developed the world's first circuit breaker for high voltage direct current (HVDC). It combines very fast mechanics with power electronics, and will be capable of 'interrupting' power flows equivalent to the output of a large power station within 5 milliseconds – that is thirty times faster than the blink of a human eye.

The breakthrough removes a 100-year-old barrier to the development of DC transmission grids, which will enable the efficient integration and exchange of renewable energy. DC grids will also improve grid reliability and enhance the capability of existing alternating current (AC) networks. We are in discussions with power utilities to identify pilot projects for the new development.

"ABB has written a new chapter in the history of electrical engineering," said Joe Hogan, CEO of ABB. "This historical breakthrough will make it possible to build the grid of the future. Overlay DC grids will be able to interconnect countries and continents, balance loads and reinforce the existing AC transmission networks."

The Hybrid HVDC breaker development has been a flagship research project for our company, which invests over $1 billion annually in R&D activities. The breadth of our portfolio and unique combination of in-house manufacturing capability for power semiconductors, converters and high voltage cables (key components of HVDC systems) were distinct advantages in the new development.

HVDC technology is needed to facilitate the long distance transfer of power from hydropower plants, the integration of offshore wind power, the development of visionary solar projects, and the interconnection of different power networks. ABB pioneered HVDC nearly 60 years ago and continues to be a technology driver and market leader with many innovations and developments. With over 70 HVDC projects, our company accounts for around half the global installed base, representing an installed capacity of more than 60,000 megawatts (MW).

Deployment of HVDC has led to an increasing number of point-to-point connections in different parts of the world. The logical next step is to connect the lines and optimize the network. We are already working on the construction of multi-terminal systems and the latest DC breaker innovation is a major step in the evolution of HVDC grids. In parallel to the new hybrid breaker development, we have an established HVDC grid simulation center developing solutions for future DC overlay grid operations.

Fast, reliable and nearly zero-loss HVDC breakers and current limiters based on the hybrid HVDC breaker concept have been verified at component and system levels at ABB's high-power laboratories in Sweden and Switzerland, for HVDC voltages up to 320 kilovolt (kV) and rated currents of 2.6 kiloampere (kA). Thus, HVDC grids can now be planned. The next step is to deploy the breaker in a real HVDC transmission line to test under continuous full load conditions.

How does hybrid HVDC breaker work? Scan here

DC Breaker – why we need it

- Fast and reliable
- Isolates faults
- Clears faults in milliseconds
- Prevents collapse of common HVDC grid voltage
- Minimizes disturbances in converter operation

AC grids	vs	DC grids
– High active power conduction losses – Reactive power conduction losses		– Relatively low active power conduction losses – Zero reactive power conduction losses

A large distribution transformer

Powering up a sustainable future

ABB has developed a Green-R-Trafo™ platform, which reduces energy consumption and increases transformer efficiency by lowering transformer losses.

The performance and the life span of a transformer can be further boosted by an environmentally friendly BIOTEMP® insulating natural ester fluid, made from renewable and biodegradable vegetable-based oil.

BIOTEMP has a higher water saturation limit and becomes a barrier, reducing moisture absorption in the paper insulating the transformer. This leads to longer transformer life or ability to overload the transformer up to 10 percent without loss of transformer life.

According to Douglas Getson, global product manager for liquid-filled distribution transformers, the Green-R-Trafo platform is configurable to meeting customer specifications. “Should a customer specify transformers for indoor application with 10 percent overload capability, ABB would offer BIOTEMP – a less flammable fluid – that also extends the volt-amp power rating of the transformer without appreciably increasing its size,” he says.

If a customer needs to reduce energy consumption, we can increase transformer efficiency by reducing the no-load core losses by making the cores from amorphous metal instead of the traditional grain-oriented electrical steel.

“Typically the main concern of customers is the overall performance of the materials over the life of the transformer, which can extend to over 20 or 30 years. There has been a significant amount of testing to prove the material and product performance over a variety of ambient conditions and applications,” explains Getson.

The tests were recently shared during a series of transformer seminars held at key utility companies across the Middle East to promote the advantages of the Green-R-Trafo. The tests proved that the transformer performance went well beyond what international standards require. Dr VR Ramanan, corporate research, ABB, Raleigh, USA presenting at the seminars, provided insight to the attendees into material properties, development and testing as it pertained to the Green-R-Trafo product platform.

Technology increases network efficiency

Distribution transformer average volt-amp loads vary from 10-60 percent. This makes transformer no-load core losses a significant component of transformer total losses. Here is where amorphous core technology can make a major impact, lowering no-load losses by up to 70 percent and increasing efficiency of the transformer. The sheer numbers of distribution transformers make them excellent candidates for improving the overall network efficiency, as they account for 2 percent of transmission and distribution losses in some regions of the world.

For more information:
www.abb.com/transformers

Another European port goes green

Ystad, one of Sweden’s fastest growing cargo and ferry terminals installs an ABB shore-to-ship power connection that enables it to use shore-side electricity while in port, thereby reducing noise pollution and cutting CO_2 emissions by 98 percent.

Eliminating CO_2 emissions at the Port of Ystad

Located on the southern tip of Sweden on the Baltic coast, Ystad is Sweden’s fifth largest port, handling some 3,500 sailings annually, including daily ferry services to Poland and Denmark, as well as cruise ships in the summer and cargo vessels all year round.

Thanks to a strong and ambitious investment program, the port has enjoyed double-digit growth in tonnage over the past three years – one of the few ports to grow in the current economic climate. Part of that forward-looking program is a bid to become the region’s greenest port by equipping all its berths with shore-side power connections.

Local partner, Processkontroll Elektriska, selected us to provide a turnkey shore-to-ship solution for all five berths at the port. We designed, engineered, supplied and built the entire solution, which feeds electricity from the local power grid to a specially designed ABB substation equipped with powerful frequency converters.

With a power rating of 6.25 megavolt amperes (MVA), the frequency converters are the most powerful in operation at any shore-to-ship installation in the world. They convert the power from 50 Hz, the standard grid frequency in Europe, to the 60 Hz load frequency at which most vessels operate. From the substation, the power is transferred via high voltage underground cables to shore-side cranes that connect the cables to the vessels.

Our solution has a unique flexibility, in that it adapts both the voltage level and frequency to match those of each vessel – enabling multiple vessels to be powered simultaneously at the port, regardless of any differences in the ships’ voltage level or system frequency.

ABB pioneered shore-to-ship technology at the beginning of the millennium by delivering the world’s first high voltage shore-side power connection for the Swedish port of Gothenburg in 2000. Since then, we have provided ports throughout Asia and Europe with shore-to-ship solutions, the most recent of which – prior to Ystad – was inaugurated in July this year at the Hoek of Holland in the Netherlands.

We also supply turnkey shipside solutions for shore-side power connections, and have provided solutions for all types of vessels worldwide, including container ships, bulk carriers, liquefied natural gas (LNG) carriers, cruise liners and floating storage and off-loading (FSO) vessels.

For more information: www.abb.com/marine

Ystad shore-to-ship installation wins environmental award

On September 27, the port of Ystad was awarded Sweden’s foremost marine environmental award by Maritime Forum, “for investing in a flexible shore-to-ship solution for both 50 and 60 Hz. The solution minimizes the shipside investment requirements for shipping companies, while improving the environment for the port’s immediate surroundings.”

Efficient shore-to-ship solutions – a possibility.
Scan here to watch the video.

Just launched

New technology solutions from South Africa, Middle East and India.

Automation product

ACS880 drive

The ‘all-compatible’ new drive

This is designed to meet the requirements set by different users, processes, businesses and environmental goals. The drive can be used in a wide range of industries from oil and gas, mining, metals, chemicals, cement, power plants, material handling, woodworking, pulp and paper to marine.

Advantages
- Customized for cranes, extruders, winches, conveyors, mixers, compressors, pumps and fans
- Easy-to-use control panel with USB connection
- Supports over 20 languages
- Integrated safety features include safe torque-off (STO) as standard
- Share intuitive and easy-to-use control panel and PC tool
- Universal connectivity

Automation product

Synchronous reluctance motor (SRM) and drive package

Energy-efficient SRM motor and drive package

This is unique due to the design of its rotor – it has no windings, unlike traditional synchronous designs. The rotor suffers virtually no power losses and its temperature remains lower than in conventional rotors.

Advantages
- Better power density
- Higher energy efficiency
- Matched motor and drive with dedicated software
- Offers smooth, efficient process control and optimal use of energy

Low voltage product

M2M meters

New measurement device in India

The made-to-measure device provides transparency on energy consumption, be it single phase or three-phase supply. Meant specifically for medium voltage and low voltage electrical panels, the product provides real-time analysis on parameters such as voltage, current, frequency, power factor and active and reactive power. One of the outstanding features of this meter is that it provides instant information on CO_2 emission-based energy consumption: important information for green building solution.

Advantages
- Multiple integrated functions
- 360° analysis of system performances
- Anticipates malfunctions
- Easy to install
- Intuitive, easy-to-use keypad
- Auto-diagnostic function

Power electronics and MV drives

DPA system

High-power, modular UPS now available in Middle East

UPS systems based on decentralized parallel architecture (DPA) do not share any common components. Each module contains all hardware and software required for full system operation. What does this mean for the customer? Very high power availability, increased flexibility, lower total cost of ownership and improved energy efficiency. Modular systems based on DPA are free of single points of failure and maximize the mean time between failure, while minimizing mean time between repair.

With DPA technology each UPS module has its independent:
- logic control
- control panel
- rectifier
- inverter
- battery charger
- static switch

Concept power DPA modules can be connected in parallel to provide redundancy or capacity, to 1.5 Mva. The class-leading design provides the highest power density/m^2 available.

Advantages
- Lower cost of ownership
- Simple installation and service
- Optimizes energy
- Advanced, scalable architecture
- True safe-swap modularity

Innovative marine propulsion

Breaking the ice

Ice-going ships from tankers to container ships with Azipod VI® propulsion can do what was once considered impossible – combine excellent ice-breaking and open water characteristics. In 1990, MV Seili, a buoy tender was the first to be fitted with Azipod, followed by MT Uikku a 16,000 DWT ice-breaking tanker in 1993 and Azipod-equipped icebreaker, IB Rothelstein on the Danube river, which became the first double acting ship in the world in 1995 – running in open water and astern in ice. The Azipod combines the advantage of the diesel-electric powertrain with the manoeuvrability of the azimuth thruster, offering design flexibility and great space saving, as well as 360°steering that provides full torque and thrust in any direction.

For more information: www.abb.com/marine

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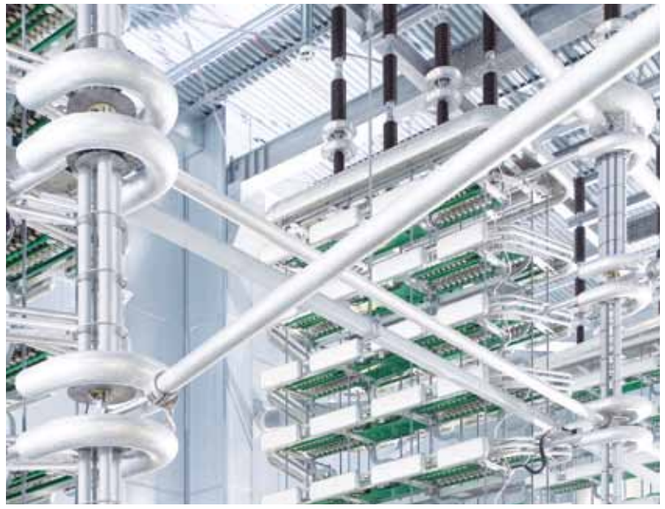
Contact is published in English for circulation among ABB customers and stakeholders with an interest in ABB offerings, products and technologies.



Preview 2|13

Revitalizing the power grid

With demand for electricity rising year on year and concern for the environment bringing more renewable energy sources online, transmission system operators are under increasing pressure to enhance the flexibility of their grids to improve capacity and accommodate the demands of deregulated power markets.

ABB's expertise in power transmission systems and electrical optimization, grid reliability and blackout prevention offers sustainable solutions to the challenges of today, and tomorrow. From Flexible Alternating Current Transmission systems that enhance the security, capacity and flexibility of power transmission networks, to High Voltage Direct Current power superhighways, there are comparatively inexpensive and faster ways to provide more power and control in existing networks. Read the next issue of Contact to see how it's done.

Cities that consume 30% less energy?

As a leading producer of energy-efficient solutions, ABB helps deliver major power savings, without compromising performance. Our lighting control systems can deliver power savings of up to 50 percent, and our building automation up to 60 percent. While everyone else is talking about energy prices, power shortages and climate change, ABB is doing something about it, right here, right now. **www.abb.com/betterworld**

Certainly.

Power and productivity
for a better world™

ABB