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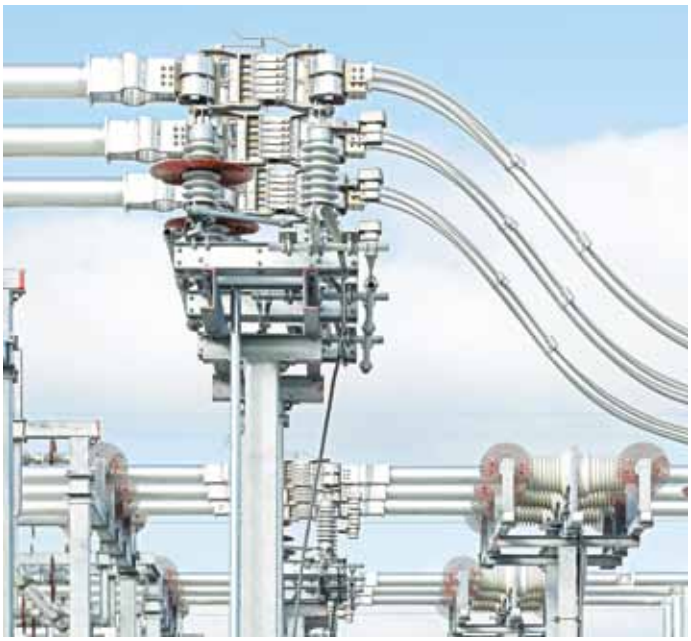
contact

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

Shaping a reliable and smarter grid



contact 2|13

Carlos Pone
Chief Executive Officer
ABB in Southern Gulf and Pakistan

Dear friends,
Reliable electricity is imperative in today's world to enable day-to-day household tasks and keep vital transport systems and businesses alive. A world without reliable power would be extremely costly, inconvenient and present many undesirable knock-on effects.

As the world's biggest manufacturer of power transmission and distribution equipment, ABB's solutions enhance grid reliability and support the systems that keep our world running.

There is a need to balance our region's appetite for power, which is increasing each year, along with concern for the environment and the need to bring more renewable energy sources online.

The traditional grid is under increasing pressure to cope, while transmission system operators must adapt and enhance the flexibility of their grids to improve capacity and accommodate the power markets' demands.

ABB is built on 120 years of expertise in power transmission systems, electrical optimization, grid reliability and blackout prevention – offering sustainable solutions for the challenges of today and tomorrow.

ABB is taking the lead in helping to meet the growing demands on the electricity grid through the latest technological breakthroughs, project management and the upgrading, optimization and servicing of existing installations.

Enjoy the read!

Best regards,

Carlos Pone

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News

Grid reliability

For a better world

Product news

Close up

HVDC subsea power transmission link in Finland

With an order worth around $130 million from Kraftnät Åland AB, we are to supply a new high-voltage direct current (HVDC) power transmission link, capable of transmitting 100 megawatts (MW) of electricity with minimum losses across a distance of 158 kilometers between the Finnish mainland and Åland archipelago, an autonomous Finnish province at the entrance to the Gulf of Bothnia in the Baltic Sea.

Åland presently receives its power through an alternating current (AC) cable from Sweden and local renewable sources. The existing fossil-fueled power generation backup facility will be closed down once the new link is in operation. The HVDC Light® link will enhance the contribution of renewables to the grid and help Finland reach its emission reduction targets.

The HVDC system incorporates special features such as active AC voltage support, providing greater network stability and the unique 'black-start' capability, which provides faster grid restoration in the event of a blackout. The system is DC grid-enabled, ie, prepared for a multi-terminal configuration, which allows for additional infeed from stations, such as future wind power plants.

For more information: www.abb.com/hvdc

High-end smart grid technology highlighted in Qatar

A range of products and technologies that boost grid reliability and provide the electrical infrastructure for smart grids went under the spotlight at the fourth General Conference of the Arab Union of Electricity and exhibition in Qatar.

Equipment displayed included circuit breakers, the Tropos wireless connection and an oil-type transformer. The Intelligent Electronic Devices (IEDs) for distribution automation and grid automation were also part of our portfolio. ABB's UniGear Motor Control Centers (MCC) on display provided a key talking point.

The smart grid is the future for electrical systems and set to provide more electricity to meet increasing demands. The technology will increase reliability and quality of power supplies, increase energy efficiency and integrate low carbon energy sources into power networks. A number of initiatives are ongoing around the world to improve the performance of the electrical system and we have many products to support them.

For more information:www.abb.com/smartgrid

In brief

Enhanced maintenance services

ABB's on-site maintenance and repair capability offers peace of mind and extensive parts availability to get you up and running fast. Preventative maintenance and total care packages are offered alongside installation, configuration and commissioning to ensure customers get the most from their new equipment.

Water sustainability for future generations at Emirati-Swiss forum

ABB joined forces at the third Emirati-Swiss Friendship Forum (ESFF) to tackle one of the greatest challenges faced by the world – water sustainability. We highlighted technology and connected with the next generation through university seminars and workshops. Gian-Francesco Imperiali, Head of ABB's Water Sector Initiative, spoke about factors affecting the power and water industry such as green technologies, climate change, digital information and global megatrends.

Hotline launched to improve service

A free phone number, 800 CALL ABB (800 2255 222) has been launched in the UAE to help customers quickly resolve service issues.

The number will cater for basic product inquiries right through to plant breakdown emergencies. All customers and prospective customers can ring the number for information about ABB and our products.

Toni Turkama, India, Middle East and Africa (IMA) region service manager said, "This single point of contact will create a more efficient customer contact management system and enable us to be competitive in the service market. 800 CALL ABB demonstrates our commitment to service, which is high on the strategic agenda of our company."

Customers can call 24 hours a day, seven days a week and will be put through to one of our highly experienced service engineers, when they need them most. From there, ABB will organize a solution to the problem, for instance, send emergency service engineers out to existing customers or arrange a client meeting.

This new number is set to simplify the service process and create a more seamless approach to helping our customers – making it easier to do business with ABB.

For more information: www.abb.com/service

Transforming the urban landscape

The increasing awareness of the need for energy-efficient, green buildings in India provides a window of opportunity for ABB's i-bus® building control solution that has transformed many buildings across the world, improving comfort and security, while significantly reducing energy consumption and improving overall efficiency.

Our solutions can be used for all types of buildings – from large, commercial projects to residential housing. Some of our landmark projects in India include the new International Terminal 3, at the Indira Gandhi International Airport, Delhi, the ONGC Building, Mumbai, projects for construction majors, resorts in Pune, hotels and the Intuit Software Park in Bangalore.

In recognition of the India KNX team's contribution to transforming the Indian urban landscape Confederation of Indian Industries (CII) and the Indian Green Building Council (IGBC) in Hyderabad, presented ABB an award for intelligent building controls.

Sudhansu Rath, Manager of ABB's KNX – Intelligent Building Controls, Indian subcontinent said, "We are going beyond just landmark projects now, towards building a low-carbon economy."

For more information: www.abb.com/knx

Smart electricity

The complex challenges of delivering the growing demand for power, as well as providing a stable and sustainable supply of electricity is driving the evolution of smart grid technologies.

FACTS solutions for improved grid reliability

There is hardly any process in industry or any application in life that does not use electricity, so much so, we take reliable power for granted. The demand for electricity is growing faster than any other form of energy – most notably in rapidly industrializing countries, such as China and India, and even momentary power disruptions cause huge economic losses.

A sobering fact today is that coal fuels more than 40 percent of the world's electric supply. To increase generation and at the same time, lower environmental impact, new solutions are needed along the electrical value chain. Transmission, distribution and consumption of electrical energy must become more efficient. As it stands, inefficiencies along the whole value chain lead to around 80 percent losses – from primary energy sources to the useful consumption of electricity.

Although renewable energy generation is growing fast, the proportion in the overall energy mix is still quite small and poses additional challenges: not least – availability, highlighting the need for efficient and reliable energy storage systems to coordinate available sources of power. To integrate the growing amount of renewable energy generation, and at the same time significantly improve efficiency along the value chain, requires massive changes in the whole electrical system, in the way it should be structured and operated.

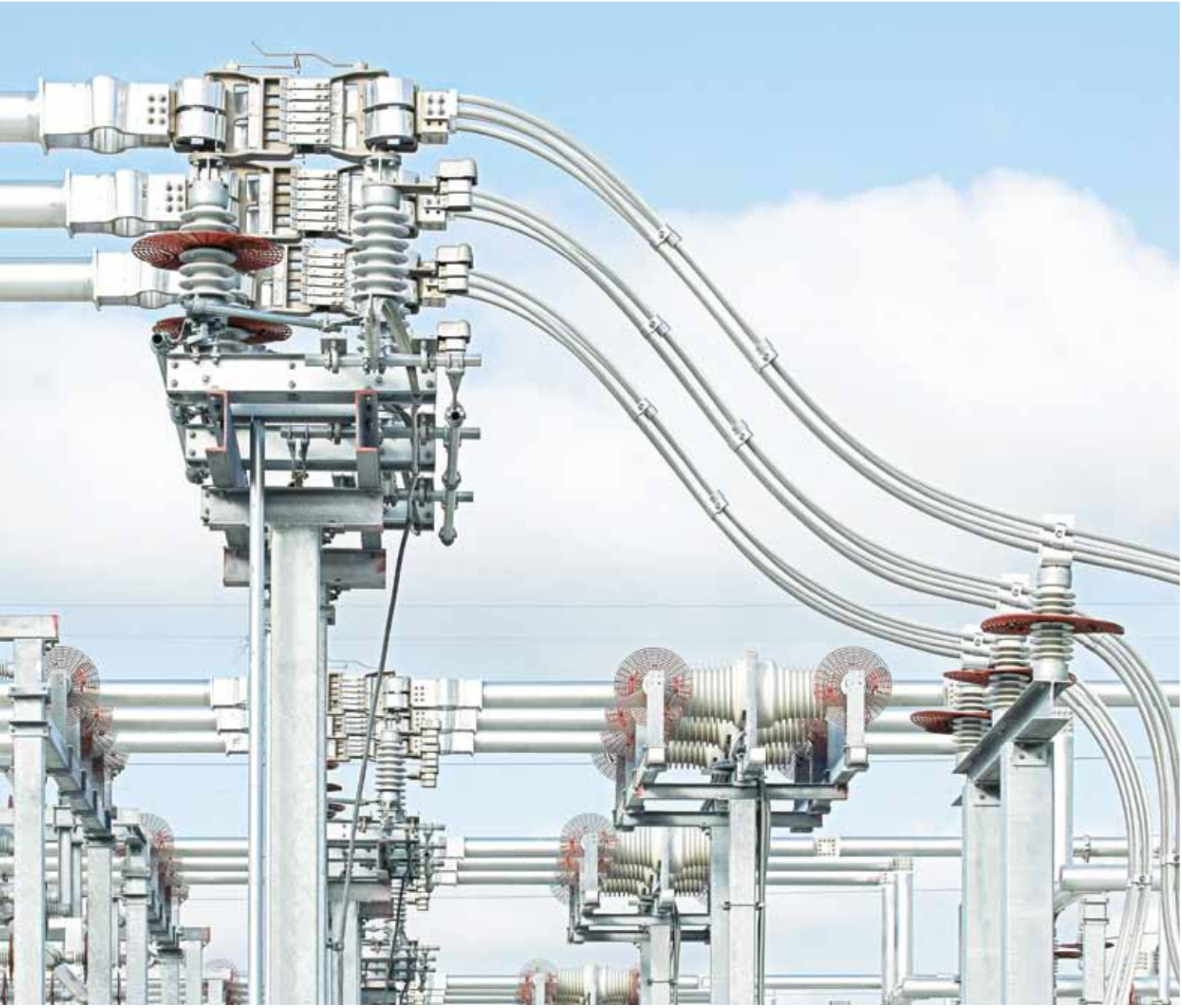
Smart Grids

The future electrical system (or smart grid), must be designed to meet four major requirements across the globe:

- Capacity
- Reliability
- Efficiency
- Sustainability

To cope with what the International Energy Agency foresees as the addition of 1 GW power plant and related grid infrastructure every week for the next 20 years, the future electric system must handle the capacity increase in an economic way.

The larger the amount of electricity transported the closer the system will operate to its stability limit. Yet blackouts or even smaller disturbances are becoming increasingly unacceptable. A 2005 Berkley lab study reported that unreliable electrical systems cost the US $80 billion annually. If an electrical system can safely handle



A smart grid is an evolving network of new technologies, equipment, and controls that work together to respond immediately to our 21st century demand for reliable, efficient and sustainable electricity.

and stabilize grid disturbances, then that system will require fewer generating plants available in reserve. This means lower emissions.

Projections by the International Energy Agency show that using energy more efficiently has a greater potential to curb CO_2 emissions over the next 20 years than all the other options put together.

The reluctance to invest in energy efficiency is surprising. Investments can usually be recouped through lower energy costs in less than two years, and under other circumstances, businesses would normally leap at such prospects of rapid returns. A major obstacle is a lack of knowledge in private households, companies, or public authorities concerning energy-efficient equipment. This challenge is further compounded by the variety of available options.

Another obstacle is a lack of incentives. Why should a landlord invest in energy efficiency if the tenant will reap the benefits? Why should a purchasing manager spend more of his budget on efficient equipment if the savings all go to the department that pays the electricity?

Efficient and reliable energy-efficient solutions are rarely replicable. Variable-

Power electronics help grids evolve into more intelligent and environmentally friendly networks

speed drives, which raise the efficiency of electric motors, sit in plain metal boxes, belying the fact that their energy saving potential is many times greater than the much touted compact fluorescent light bulb. The drive systems installed by ABB alone save as much as 170 million metric tons of CO_2 every year globally. This corresponds to 20 percent of all emissions in Germany.

The European Union took an important step in June 2009 when it set efficiency standards for most of the electric motors used in industrial applications. The move was barely noticed, yet it is expected to save 135 billion kilowatt-hours per year by 2020. That is three times more than the savings expected from phasing out incandescent light bulbs in the European region and equals more than Sweden's total electric power consumption (which in 2007 amounted to 132 billion kWh).

Sustainability

Generating electricity with solar, wind, wave or geothermal energy is without doubt a powerful way to avoid CO_2 emissions. There is hope that with improving technology, better conversion efficiency and lower production costs, the contribution of such sources to the future energy mix will increase.

Hydropower is the traditional CO_2-free source of electrical energy and according to the IEA this will continue to be the case for the next 20 years. Generating electricity in this way is one task; the other equally important requirement is to connect it to the electrical grid. Huge distances have to be bridged to carry electrical power from hydropower plants to the centers of consumption. In China, for example, bulk power is being transported more than 2,000 km with low transmission losses.

Intermittent wind-power generators pose another challenge to grid stability and the need for additional reserves, but adequate technology is also required to connect them from remote places far offshore.

Efficient and reliable energy storage will ultimately help to overcome the issues of intermittency and HVDC cable technology is the way to cross the sea.

The final influence, however, is the end consumer who decides how much and in which way he wants to consume energy. At the present energy costs and in view of the difference between high and low tariffs, the incentives to save energy or use it at times of lower cost are limited.

Technology could provide greater transparency regarding consumption at any moment in time and its associated cost to the consumer. The resulting demand/response relationship between generators and consumers makes a further contribution to the reduction of the required generating reserve.

ABB has the full portfolio of products, systems and services to further improve and develop the electrical system. Wide area control systems, flexible AC transmission systems, substation control, HVDC systems, cable connections, distribution control and low-voltage systems address the grid. Drive systems, efficient devices and a broad application of process control technologies help to increase the efficiency in industrial and commercial applications. Building automation and control is another area with energy saving potential served by us. ABB meters and the connected communication technology that facilitates demand-response interactions and the

Interview

Importance of reliability in grid operations

Claes Rytoft, head of technology for the Power Systems division of ABB tells us how technology can prevent blackouts and create reliable energy networks.

What do we really mean by grid reliability and why is it important?

A grid has to operate 24/7, all 365 days of the year. Whatever it takes to make this happen is what we mean by grid reliability. Redundancy is designed into a transmission grid to handle outages through parallel paths, the design criteria – n-1 means the grid can withstand loss of one transmission line of a certain power rating.

What are the key elements that can facilitate grid reliability?

The most important factor is the generation mix. Integrating intermittent power from renewables increases the risk of destabilizing the grid. Depending on the percentage of renewables, it is much more complicated now to plan power generation and indirectly, grid reliability.

Another crucial element is the transmission network capacity. In India there is an increasing demand for high-voltage direct current (HVDC) lines for transmission of bulk power over long distances with fewer conversion and transmission losses.

What are blackouts and how are they connected to grid reliability?

Blackouts can be caused by a short circuit, damage to transmission lines or by overloading the electricity mains. Quite often they happen when there is a miscommunication between control centers.

To prevent blackouts, functionalities have been added to strengthen the traditional grid. Substation automation and protection systems safeguard human life and machines, allowing operators to remotely control and monitor switching for an entire region. In Karnataka alone, our systems monitor and control 1,317 main transmission and distribution substations spread across the state.

What does ABB have to offer to help enhance grid reliability?

Everything – except power generation equipment. ABB has several solutions from production planning software to adding transmission capacity through flexible alternating current transmission systems (FACTS). In India, FACTS can help stabilize the grid, reduce losses in long AC lines and filter out disturbances.

Could you shed some light on this area from a broader region perspective?

There is a lot of interest in solar in Africa, the Middle East and India. The hot climate is a better fit as peak hours coincide with peak generation, simplifying the addition of renewables to the grid.

Even so, every time generation capacity is added, there are some problems with transmission capacity. The focus on solar has added complexity to keeping grids stable. Energy storage, still at the pilot project stage, is complicated and expensive and not an option in the short term. When commercially viable energy storage technology is developed, it will change the way grids are built.

Could you tell us about some of the latest technology advances in this area?

ABB's hybrid HVDC breaker comes right at the top. The ability to interrupt direct current makes it possible to join HVDC transmission lines to form a resilient power grid that could provide an efficient way to transmit power from widely distributed sources of renewable energy.

Our Ventyx Network Manager SCADA/EMS is a key component for powering smart grids, enabling power utilities to control and manage complex energy systems, reduce operation costs and ensure cyber security.

Smart meters allow real-time usage monitoring through new wireless, digital technology that anchors next-generation grids. But, so far there has been no broad-scale rollout.

software to operate energy markets is in use in many locations worldwide.

ABB is committed to lead further development of smart electricity, providing efficient power for a sustainable world.

For more information:

www.abb.com/gridreliability

Oncor – the largest power T&D company in Texas, serves some 3 million customers

Making of a metropolitan power grid

An award-winning ABB solution is helping a US power company save almost one million megawatt-hours of energy and associated CO_2 emissions a year.

The energy-efficient solution using ABB's FACTS technology enables Texas-based electric utility, Oncor, to increase the capacity, secure the reliability and improve the energy efficiency of its power network in north Texas and the Dallas-Fort Worth metropolitan area.

Oncor is the largest power transmission and distribution company in Texas, serving some three million homes and businesses, including most of Dallas-Fort Worth, the fourth largest metropolitan area in the United States with a combined population of 6.5 million.

The solution has also earned Oncor the state's highest award for environmental excellence from the Texas Commission on Environmental Quality.

According to the commission, which made the award in April 2010, the solution eliminates the need to generate an estimated 563 hours of peak-load electricity and saves almost one million megawatt-hours of energy and associated greenhouse gas emissions a year.

The solution encompasses the world's largest and fastest-acting concentration of static var compensators (SVC), which react in just 20 milliseconds whenever voltage fluctuations threaten to destabilize the grid.

Voltage fluctuations are usually caused by increased demand for electricity during peak periods. But in Dallas-Fort Worth, other long-term stress factors are also involved: consistent year-on-year growth in demand, the recent retirement of several local power plants, and the increasing amount of wind power and remote power generation in the Texas energy mix.

Integrating renewable energy

The SVCs enable Oncor to integrate renewable energy and reduce its dependence on locally generated fossil-fueled power, thereby reducing greenhouse gas emissions and improving the environment in the Dallas-Fort Worth area.

The SVCs have been operating at the Parkdale substation in Dallas since June 2009. In the first 10 months of operation they successfully responded to 38 power grid events that threatened grid stability.

The results of the installation have been so successful that Oncor has ordered two additional SVCs from us, which are currently being installed at the utility's Renner substation in Plano, a northern suburb of Dallas.

SVCs are part of ABB's family of flexible AC transmission systems (FACTS), solutions that increase the capacity of existing transmission networks by as much as 50 percent, while at the same time improving their reliability.

We delivered the Parkdale solution in the record and unrivaled time of just 14 months. ABB is a global leader in FACTS technologies and has more than 700 installations in operation or under construction around the world, around 50 percent of the market total.

For more information: www.abb.com/gridreliability

Ensuring availability and quality of electricity in Oman

In the second phase of Mazoon Electricity Company's development of the country's power infrastructure, ABB's software solutions will improve network transparency and the efficiency of power systems.

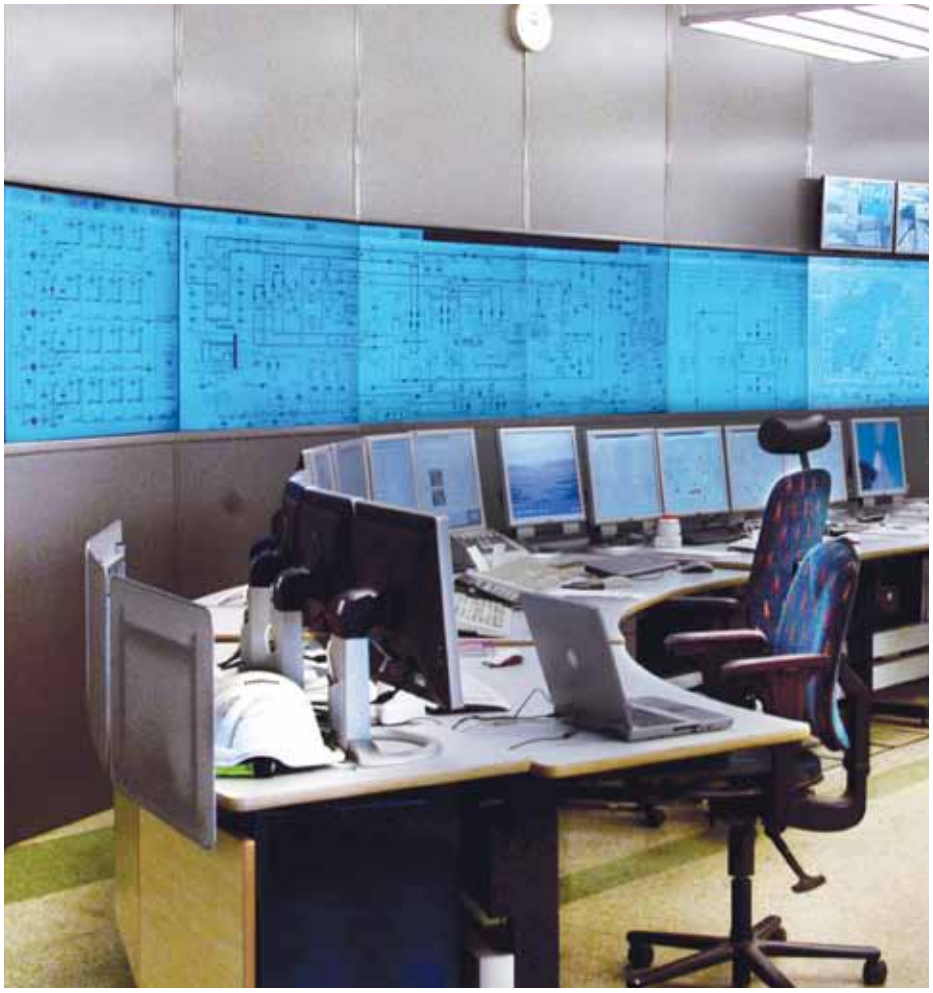


ABB solutions improve network transparency and power systems efficiency

The Mazoon Electricity Company awarded a $7 million contract to ABB for improving the availability and quality of electricity in Oman. A range of components will be delivered, such as a Network Manager supervisory control and data acquisition (SCADA) system and multiple remote terminal units (RTU).

In addition, 90 outdoor remote terminal unit stations will be supplied on a turnkey basis for Mazoon, one of Oman's main electricity distribution companies. This includes interfaces for 33/11 kV substations and the supervisory control and data acquisition system to control and monitor electricity supplies in Oman. The SCADA system will cover the grid areas of South Batinah, Dakhliyah and Sharqiyah governorates.

Network Manager SCADA, which is part of ABB's Ventyx software portfolio, offers a full range of solutions that enhance the efficiency and reliability of power systems. The software is used in infrastructure projects such as electric grids to monitor and control entire sites or complexes of systems spread out over large geographical areas. Most control actions are performed automatically by RTUs and substation control systems.

"This project is another step in Mazoon's development of its infrastructure in order to improve transparency on its network, which ultimately helps the company provide a cleaner, more reliable and smarter service to its customers," said Saeed Fahim, Manager of ABB in Oman. "We are pleased to be able to work with Mazoon again on this project after successful cooperation in phase I."

In phase I, ABB installed a new Network Manager SCADA system at the main control center to integrate existing 33/11 kV feeders and equipment in all grid substations, as well as indoor primary stations.

For more information: www.abb.com/gridreliability

HVDC Light – strengthening grids and enabling power trading

Caprivi Link Interconnector

A 350 kV HVDC Light® system stabilizes two weak networks in Namibia and enables power trading in the expansive region of southern Africa.

The Namibian transmission system operator, NamPower, chose the HVDC Light (high-voltage direct current) system to electrically connect the northeastern part of the country to central Namibia, a distance of 950 kilometers. ABB was contracted to build the 350 kilovolt (kV), 300 megawatt (MW) transmission link between Zambezi, close to the Zambian border in the region of Caprivi, and Gerus in the central part of the country. HVDC Light technology helps to stabilize the two weak networks.

The high voltage transmission system, providing a new route for power imports, was officially inaugurated by Namibia's President, His Excellency Hifikepunye Pohamba. The HVDC Light system is part of a greater scheme that includes a 950 kilometer-long DC overhead line, an upgrade of an existing AC overhead line from Gerus to Auas to 400 kV, the extension of the Gerus and Auas substations, and a new AC substation in Zambezi.

The Caprivi Link Interconnector, connecting electricity grids in Namibia and Zambia, ensures reliable power transfer capability between the east and west of the Southern African Power Pool (SAPP). It is also the first electrical connection between the Caprivi region of Namibia and the rest of the country, and is able to supply power to the region if normal supplies from Zambia are disrupted. Even larger islanded parts of the Namibian and Zambian grids can be supplied by the DC link, which maintains frequency control and thereby avoids power outages.

We were responsible for system engineering, including design, supply and installation of the two converter stations and earth electrodes. ABB's innovative and environmentally friendly HVDC Light is a high-voltage direct current transmission technology that is capable of stabilizing weak electricity networks by means of powerful voltage control. The design also allows for a bi-pole extension to 600 MW. “The new Caprivi Link Interconnector will secure power supplies, strengthen grid reliability and facilitate power trading in the region,” said Martin Gross, head of ABB's Grid Systems business. “Our HVDC Light technology is ideally suited to enable the efficient transmission of electricity and integrate clean renewable energies like hydro power.”

"The Caprivi Link Interconnector, connecting electricity grids in Namibia and Zambia will ensure reliable power transfer capability between the east and west of the Southern African Power Pool (SAPP)," said NamPower's marketing and communications officer, Tangeni Kambangula.

This project extends the voltage rating for HVDC Light to 350 kV and marks the first time the technology has been used in overhead transmission lines instead of underground or underwater cables.

For more information: www.abb.com/hvdc

Improving grid reliability at Dubai International Airport

A contract was awarded by Dubai Aviation City Corporation (DACC) – Engineering Projects for the extension of the existing ABB SCADA monitoring system at the Dubai Airport in the UAE, a major global aviation hub.

The airport-wide electrical supervisory control and data acquisition (SCADA) system gives the airport operational staff an excellent overview of the status of the electrical distribution in the whole area. The scope of supply includes remote terminal units (RTU), telecommunication and integration of new field equipment in the SCADA system. The system allows full supervision and easy operation of the electrical grid of a modern airport that operates 24 hours a day, seven days a week, and is ranked as fourth busiest airport in the world.

ABB was first awarded the project for the implementation of the Airport Distribution SCADA (11 kilovolt network) in 2004. Earlier we installed RTUs, fiber optic cables (for SCADA system) and integrated RTUs (for Ring Main Units) and programmable logic controllers (PLC) from the main distribution system, creating a state-of-the-art in-plant SCADA system. This additional work will see RTUs, telecommunication and integration of new field equipment in the SCADA system.

“Implementing the first SCADA system was the beginning of a successful partnership. Additional requirements made it necessary to expand the system, adding more data, more substations and more distribution equipment. We are delighted that a new contract has been signed between ABB and DACC, Engineering Projects to further develop the SCADA system,” says De Villiers, Manager for ABB’s Power Systems division in the Gulf countries.

The system, which is now part of our Ventyx portfolio, includes functions such as dynamic network coloring, giving the operators an easy-to-read overview of the connectivity of the system. In addition, it provides gas turbine logic that automatically connects loads to the system after ramping up emergency gas turbines that will be started only in case of a blackout i.e, losing the 132 kV connections with the electrical supplier.

ABB is a leader in SCADA solutions for the oil and gas, power transmission and distribution, alternative energy, and water and waste-water markets and has extensive SCADA experience focusing on efficient, safe and profitable SCADA operations for customers.

Dubai airport – engineered for the future

For more information:

www.abb.com/networkmanagement

Service solutions discussed at Bahrain seminar

Time and condition-based maintenance saves energy and reduces CO_2 emissions, while increasing productivity.

Seminar held to teach customers about ABB service solutions

Customers from major industries in Bahrain took part in a seminar to learn about service solutions and ABB's Life Expectancy Analysis Program (LEAP) for stator windings of high-voltage rotating machines. The benefits of the concept include reduction of plant downtime due to maintenance process and increase in productivity.

The materials and components of electrical machines are subject to thermal, electrical, ambient and mechanical stresses. This leads to a process of degradation as materials lose strength over time. ABB's time and condition-based maintenance strategies can be applied at the early stages of equipment life cycle.

The seminar demonstrated how to go green by upgrading classic drives – timely replacement of drives can lead to significant energy savings and reduction in CO_2 emissions.

Systematic maintenance management

Surveys have shown that for larger motors, above 2000 kW, the most common cause of failure was in the stator (static) windings at nearly 61 percent. Since these larger machines are in the most widespread use in the oil, gas and petrochemical industries, LEAP analysis is focused on assessing the condition of stator windings.

LEAP tracks the development of defects over time and can be directly integrated into a maintenance plan. ABB offers a package of DC (PDCA) and AC (Non-Linear Insulation Behavior, Partial Discharge and Tan Delta and Capacitance Analysis) measurements, to assess the condition of the stator winding.

Additionally, the program enables an operator to know, with a high level of confidence, how long a motor or generator can remain in service before a failure. "This systematic approach to maintenance management, when used in conjunction with the known time to repair or replace a component, allows service to be performed during planned downtime, rather than during a costly emergency," said Mostafa State, ABB's Machine Service Sales Manager in the Gulf.

The program provides operators with detailed information on the condition of the stator insulation so they can plan effective action to prevent the failure and increase the overall life of the machine. To carry out a LEAP analysis, we take a range of sophisticated instrumentation to site that enables a battery of tests to be performed on the stator winding insulation. This instrumentation is available throughout the world via our network of 17 global service hubs.

For more information: www.abb.com/service

Improving Saudi rail network's power supply

FACTS solutions enhance reliability of transmission grid feeding major railway interconnections.

ABB strengthens transmission grid and power to Saudi Arabian rail links

An order worth $115 million has been awarded by the Saudi Electricity Company (SEC), the country's national power transmission and distribution operator, to provide a flexible alternating current transmission system (FACTS) solution enhancing the reliability of the transmission grid that feeds major railway interconnections. This is the biggest FACTS order received by the company. The order was booked in the third quarter of 2012.

Concern for the environment, urbanization and the need to move more people and freight faster, makes rail infrastructure a key component for a country's economic success. ABB provides reliable, innovative and energy-efficient power and automation technologies for modern urban, conventional and high-speed rail networks.

The Institute of Electrical and Electronics Engineers (IEEE) publication, Spectrum, named FACTS among its Top 11 technologies of the decade. IEEE is one of the world's largest professional associations for the advancement of technology. As part of the turnkey solution, we will design, supply, install and commission two identical static var compensators (SVCs) at the Haramain High Speed Railway's (HHR) 380 kilovolt (kV) substations. These installations will support the large scale railway interconnection between the cities of Mecca and Medina. The project is scheduled to be completed by 2015.

"This solution will help strengthen the transmission grid and enhance reliability of power supply to important rail links being developed in Saudi Arabia," said Brice Koch, head of ABB's Power Systems division. "SVCs are part of ABB's family of FACTS technologies, which help enhance the capacity and flexibility of power transmission systems and also contribute to the development of smarter grids."

In 2011, ABB won an $85 million order to supply 380 kV indoor gas-insulated switchgear (GIS),a key component of the new substations to power the 444 kilometer long high-speed Haramain rail line. These substations will supply electricity to high-speed (360 kph) electric trains that are expected to help transport about three million passengers annually. The new rail line is expected to reduce traffic congestion on the roads and cut travel time between Medina and Mecca from six hours to two.

ABB is a global leader in the growing field of FACTS and has delivered more than 800 such installations across the world. FACTS technologies allow more power to reach consumers with minimal environmental impact, lower investment costs and shorter implementation times than the traditional alternative of building new power plants and transmission lines.

For more information: www.abb.com/gridreliability

World's most powerful DC data center wins energy efficiency award

The Zurich-West data center using direct current (DC) technology has won the prestigious Watt d'Or award from the Swiss government.

The Zurich-West data center facility earned the Watt d'Or award for the scale of the energy savings achieved through the pioneering use of DC technology. ABB, HP and Green, one of the top information and communications technology (ITC) service providers in Switzerland, opened the data center last year.

The data center is "an international showcase for Swiss clean technology, as it uses high-voltage direct current technology from Swiss company ABB," the Swiss Federal Office of Energy said in a statement. "Thanks to the elimination of losses from current transformations and waste heat, it uses 20 percent less electricity and sets new standards."

We installed the 1 megawatt DC power distribution solution for the 1,100 m^2 expansion of Green's Zurich-West data center. The project underlines our goal to create new power options through expanded DC applications.

ABB pioneered technologies that made conversion between AC and DC systems possible and was the first to commercialize long distance high-voltage DC power transmission. ABB is now applying DC to medium- and low-voltage applications in electric vehicle charging, power distribution systems on ships, in buildings and in data centers.

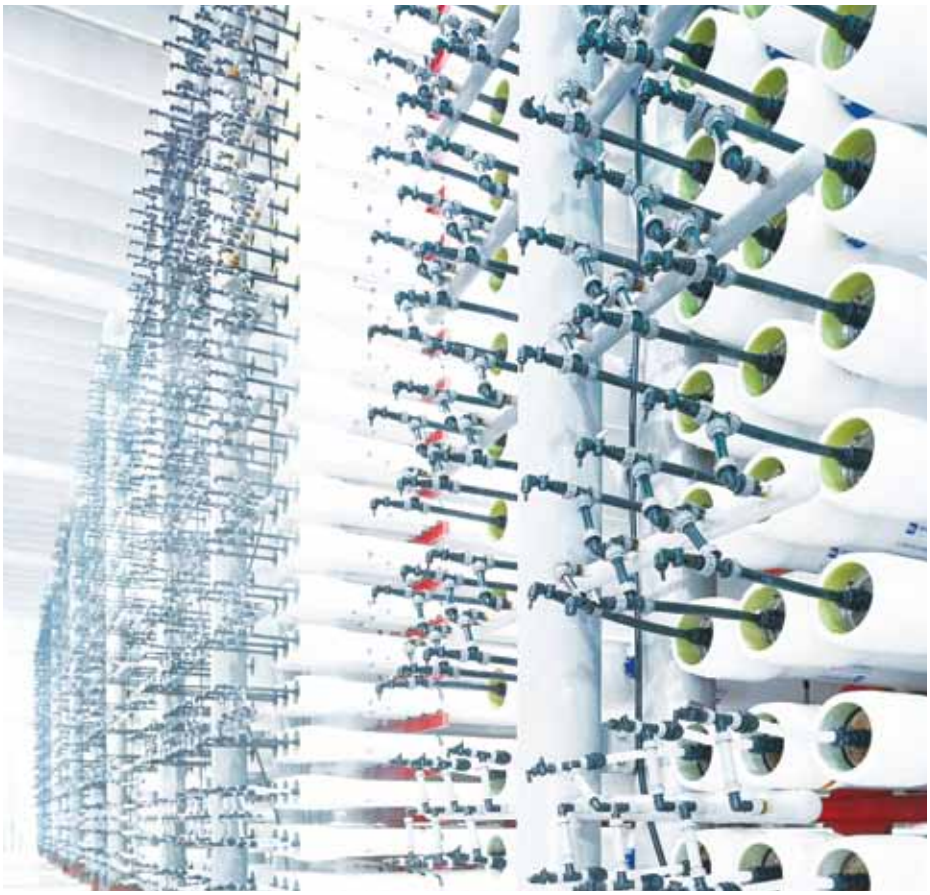
For more information: www.abb.com/datacenter

ABB offerings for data centers

- DecathalonTM: Data Center Infrastructure Management (DCIM) – Built on an open platform design, the DCIM provides remote management of data center operations enterprise-wide through a unified view – so operators can deliver services faster, in the most reliable and efficient way possible.
- Data center services
- Consulting, data center enterprise management and on-site services
- Electrical solutions
- Worldwide, ABB is known for its electrical solutions offerings. For data centers, we can provide an exhaustive range of transformers and switchgears for high-, medium- as well as low-voltage.
- UPS solutions
- Newave (now a part of ABB) provides a UPS solution for critical power supply.

Leading technology to bring drinking water to millions

A reverse osmosis technology solution for the world's largest seawater desalination plant in Algeria will boost energy efficiency and cut maintenance downtime from weeks to days.



Enhancing the efficiency of reverse osmosis

The solution is a complete and highly optimized electrical package that will power the Magtaa desalination plant in Algeria at an unprecedented level of energy efficiency and significantly reduce the length of scheduled plant shutdowns for maintenance.

Located at Oran, Algeria's second largest city, the reverse osmosis seawater desalination plant will produce up to 500,000 cubic meters of drinking water a day, enough to meet the daily requirements of about five million people.

ABB has completed the erection, testing of switchgear and equipment supplied. Now, the testing of electric drives and hot-commissioning of the system is in progress. When operational, in the second half of 2013, Magtaa will be the largest seawater desalination plant in the world using reverse osmosis technology – built, owned and operated for a period of 25 years by Asia's leading technology-driven environmental company, Hyflux.

Electrical power consumption is one of the biggest single running costs of desalination, so making the process more energy-efficient directly translates into affordable potable water.

We are supplying a complete electrical solution for the entire desalination plant and a 220 kV outdoor substation,which will connect the facility to the Algerian power grid and ensure that the plant receives a reliable supply of electricity without impacting grid stability.

The solution includes 33 medium-voltage drives that will reduce plant electrical losses from the benchmark target of 5 percent to only 3 percent – a huge improvement in energy efficiency, compared to accepted industry standards.

In addition, the drives will speed up the long plant startup process after maintenance or power-failure related shutdowns, reducing the length of plant downtime, compared with the more traditional method of mechanical control.

Over the course of Hyflux's 25-year operation of the plant, these improvements in energy efficiency, plant productivity and reduced wear and tear made possible by the ABB solution will provide a huge and sustained boost to plant profitability.

As one of the leading suppliers of power and automation solutions to the water sector, we offer complete capability in integrated and optimized instrumentation, control and electrical (ICE) systems as well as a range of automation products that improve the energy efficiency, productivity and reliability of plant assets.

For more information: www.abb.com/water

Did you know?

Reverse osmosis is a process used to turn seawater into potable water. Seawater is forced, (ie, using a pump) through a fine-pored membrane. Water molecules pass through the membrane while salt and impurities are retained. Exerting pressure to reverse the flow is necessary because in regular osmosis, water molecules naturally flow in the direction of higher concentrations of salt and impurities, rather than away from them.

Star Cruises awards ABB exclusive service contract

We have undertaken preventive maintenance of all equipment onboard the SuperStar Virgo to increase reliability and lower maintenance costs for the Hong Kong-based cruise company.

SuperStar Virgo

The SuperStar Virgo is the flagship of the line, Star Cruises' sole mega-ship and the only purpose-built ship of the fleet. Built in Papenburg, Germany, she has had an illustrious career, operating cruises from Singapore and then from Perth, Australia. She was redeployed to Hong Kong for the duration of the Beijing Olympics in 2008, before returning to Singapore. The largest floating five-star resort in Asia, the SuperStar Virgo offers more than 16 restaurants and boasts a 100 meter mega waterslide aboard.

Winning the long-term service contract from Star Cruises for preventive maintenance of all ABB equipment onboard SuperStar Virgo for the next five years is a significant achievement. The approximately $1 million contract was signed in the fourth quarter of 2012 and came into effect on January 1, 2013. We are carrying out periodic maintenance visits. The benefits of the long-term contract include increased reliability, extended equipment life time of all ABB equipment and reduced maintenance related costs, making the budget more predictable for Star Cruises.

Star Cruises, the world's third largest cruise company, has led cruise development in the Asia-Pacific region, where it operates seven vessels between the ports of Singapore, Port Klang in Malaysia and Hong Kong. Star caters to Asian passengers as well as to North Americans, Europeans and Australians, keen on sailing to Asian destinations. Its energy saving program has given Star Cruises best-in-class status in the cruise industry.

"A lot of effort and time has been put into coordinating several small service providers to carry out the maintenance of Star vessels," pointed out Mikael Mattsson, AVP Marine Operation, Star Cruises. "Through this service agreement, ABB becomes our sole service provider for equipment such as rotating machines, switchgears, transformers, drives, automation etc, considerably optimizing the maintenance process."

"The market is looking for ways to increase safety and uptime of vessel operation, while extending the life cycle of their assets and making costs more predictable," explains Heikki Soljama, Head of ABB's Marine and Cranes business. "ABB has responded very successfully to this demand, with a wide range of service agreements that provide security for our customers' operations and business. In ABB, this has been the basis for building long-lasting and trusting relationships with ship managers and ship owners."

The service contract covers periodic maintenance visits, scheduled when they least disturb SuperStar Virgo operations. A long-term approach to maintenance and reduction in the variable costs caused by maintenance-related actions make budgeting more predictable. Additionally, the contract ensures effective communication and transparency between Star ship-management and ABB engineers.

For more information:
www.abb.com/processautomation

Raising the bar in electrical efficiency

Custom-built devices and measurement units launched in India and the Middle East increase and optimize the availability and reliability of electrical systems.

Phasor Measurement Units

RES670 and PSGuard

Traditional control systems that monitor the magnitude of loads and voltages fall short of providing information regarding the transient behavior of the transmission network to system operators. This gap in information is bridged by Wide Area Monitoring Systems (WAMS) using Phasor Measurement Units (PMUs).

Advantages

- Up to 8 analog phasors, with ability to send positive, negative, zero sequence values, or all
- Reference for the phase angle – GPS or IRIG-B
- High measurement accuracy of voltages and currents
- Customized / pre-configured measurement solutions

Advantages

- Proven suite of advanced WAMS applications
- Scalable server-client architecture, range of applications, step-wise introduction
- Supports IEEE C37.118 compliant PMUs
- Powerful data storage and export capabilities
- Integration into platform-independent SCADA/EMS systems
- Modern and intuitive HMI real-time information of the power system status
- Flexible data exchange
- OPC interfaces ensure interoperable solutions

True modular power protection

DPA UP-Scale ST 200

Newave, an ABB company, has launched an extension to the DPA UP-Scale ST range of uninterruptible power supplies (UPS). The DPA UPScale ST 200 extends power capability from 120 kW up to 200 kW, while keeping a footprint of just 0.42 m^2. This most compact, true modular UPS system is ideal for organizations that aim for zero downtime and low cost of owenrship.

Advantages

- Delivers true modular power protection from 10 to 200 kW (in 10 or 20 kW steps) in a single, industry-standard frame
- Flexible design provides a 'pay as you grow' model
- Modules can be replaced without powering down
- Best-in-class efficiency of up to 96.5 percent

Enormous energy saving potential

Emax 2

Coming soon to the Middle East and Africa is the first low-voltage circuit breaker with integrated energy management functions. The annual savings potential of 5.8 million megawatt-hours is the equivalent yearly electric consumption of 1.4 million EU households. Used for protection and control of large amounts of energy used in low-voltage environments like industrial and commercial buildings, data centers or ships, the Emax 2 breaker will typically pay for itself within a year.

Advantages

- Contains a protection trip unit with an integrated power controller
- Patented algorithm to measure and evaluate energy consumption
- Manages the loads to maintain or reduce the peak power usage as determined by the user
- Prevents blackouts as the root cause is often peak demand exceeding supply

Powering India's super grid

1200 kV transformer for Bina test station
The 1200 kilovolt (kV) ultrahigh-voltage (UHV) AC power transformer in Vadodara marks another milestone in the company's long history of technology and innovation in India. This will be the highest AC voltage level in the world, helping boost load capacity and improve grid reliability, while keeping losses in check.

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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

Fuelling innovation in oil and gas

Oil and gas account for more than half of all primary energy consumed globally. Presently, at 142 million barrels per day (MBPD) combined oil and gas production is almost double of what it was in 1973, and is likely to reach 180 MBPD by 2030. It is likely that these fuels will continue to feed a large share of the world's hunger for energy in the foreseeable future.

Maintaining the dependability and reliability of supply is critical. It is also a technological challenge: of enabling exploration, extraction, processing and transportation of oil and gas in a safe, clean, energy-efficient and affordable manner.

ABB strengthens the oil and gas value chain through technologies and services. Read how we support the industry in its entire cycle of activities, from exploration to transportation in the next issue of Contact.

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