

CONTACT

Issue 2 / 2006
The ABB India Magazine



ABB

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Editorial Team

Harmeet S Bawa – *Head, Corporate Communications*

Suma Boby – *Content Editor*

Anuj Sharma – *Automation*

Namita Asnani – *Power*

ABB Limited, GF-Corporate Communications, India
Khanija Bhavan, 2nd Floor, East Wing, 49, Race Course Road
Bangalore - 560 001.

abb.co.in/contact
email: gf-cc.india@in.abb.com

Design – Shiloh Associates



Dear friends,

With an installed power capacity of less than 150,000 MW, a per capita consumption as low as 500 units (global average approx. 2600 units ; China 1100 units), only 55 per cent of households across the country with access to electricity and more than 125,000 villages still to be electrified - India certainly has a long way to go when it comes to closing the demand-supply gap in terms of its power needs. This fact is further accentuated if India is to achieve its GDP growth ambition of 8 to 10 % and double digit industrial growth.

Simple arithmetic tells us that if India has to catch up with global average, we would need to increase our power generation capacity at an accelerated pace to reach around 750,000 MW ! In addition to increasing power generation capacity it is just as crucial, if not more to take the low-hanging fruit from reduction of T&D losses, energy savings and grid efficiency.

State-of-the-art technologies, including modern IT based solutions can help optimise production and delivery of energy and facilitate better communication and balance. These technologies should be leveraged to enable seamless integration across the value chain.

This issue of CONTACT is focused on power generation and gives you a peek into some of ABB's integrated solutions for power plants ranging from automation, optimisation and automation to complete electricals, controls and environment-friendly technologies. As always, you also get to read about some of the latest happenings in the world of ABB and its partners both in India and globally.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Ravi Uppal', written over a horizontal line.

Ravi Uppal
Vice Chairman and Managing Director, ABB India



Strengthening power grids

ABB recently won a turnkey substation contract with the U.K. utility, National Grid, to strengthen power supply in the southeast of Manchester, one of the country's largest cities. ABB will replace an existing outdoor 275 kilovolt (kV) substation, nearing the end of its service-life with an indoor substation based on compact, state-of-the-art, Gas Insulated Switchgear (GIS) technology thereby reducing the size of the installation by 90 percent. The project also includes re-configuring overhead lines coming into the substation, system reinforcements and extensions to an adjacent 400 kV Air Insulated Switchgear (AIS) substation.



Increasing power plant capacity



ABB will help increase the electrical power output from OKG's largest nuclear reactor, Oskarshamn Unit 3, on the southeast coast of Sweden. ABB's technology and power plant expertise will be leveraged to ensure reliable and safe transmission of electricity from the plant's power generators to Sweden's 400 (kV) grid. By upgrading the electrical and turbine plants, the power generation capacity will increase from 1,200 to 1,450 megawatts, which is enough additional power to heat about 100,000 homes. ABB will deliver power transformers, modifications and certification of generator circuit breakers and isolated phase bus ducts, as well as project work and support to the plant.

Reducing water loss

A leak management solution from ABB will help the Bangkok Metropolitan Waterworks Authority (BMWA) reduce annual water loss by 160 million cubic meters and save \$4 million in treatment and energy costs. The BMWA identified water loss as its number-one priority and is striving to reduce annual leakage from an estimated 40 percent in 2000 to 30 percent by the end of 2006.

Integral to the Bangkok MWA's efforts to minimize water loss and improve operational efficiency, is a customized ABB automation solution that enables the water authority to monitor flow and pressure data at 1,000 measuring points and transmit data to a central control center. ABB's Water Leakage Management Software (WLMS) will perform leakage calculations to determine water loss levels in district metering areas throughout the Greater Bangkok area. The solution is based on ABB's award-winning

System 800xA automation platform and includes the WLMS and Power Generation Information Management (PGIM) software, the expansion of an existing ABB SCADA system with 800xA and AC800M controllers, MagMaster electromagnetic flow meters, and CTU800-CPE remote terminal units.

Application software like geographical information systems, water network analysis, customer information systems and billing systems is integrated with the solution.



Harnessing wind power

The 54-megawatt (MW) Mont Miller wind farm feeds electricity to more than 15,000 homes in the Gaspésie region of Quebec, Canada contributing to clean and renewable energy and the diversification of power generation facilities. At Mont Miller, production is forecast at more than 195,000 MW/hours per year. ABB supplies all electrical components and infrastructure for converting the wind tower

blades' rotational energy into electricity. This includes generators and motors, low and medium voltage drives, medium voltage switchgear, transformers, low voltage products, control and protection units, electrical substations and converters that correct the voltage of wind-created electricity, enabling it to join the main power distribution grid.



Optimizing cement plants



ABB increased production at a Holcim cement plant in Italy by 8 percent and improved key quality indicators by between 25 and 40 percent - enabling Holcim to recoup its investment in only four months. The solution, based on ABB's industry-leading Expert Optimizer™ process optimization system, was installed in the kiln and cooler sections of Holcim's Ternate cement plant in northern Italy. The plant has a capacity of 2,600 tons of clinker a day.

The project goals were to increase production, achieve a more consistent

product quality and raise the plant's consumption of alternative and subsidized fuels like chemical and animal waste products, while simultaneously improving process stability.

Expert Optimizer is installed in some 170 clinker kilns worldwide producing more than 100 million tons of cement a year. It is the only optimization system to include expert systems and model predictive control in the same system, thereby providing cement manufacturers with a choice of technologies most appropriate to their needs.

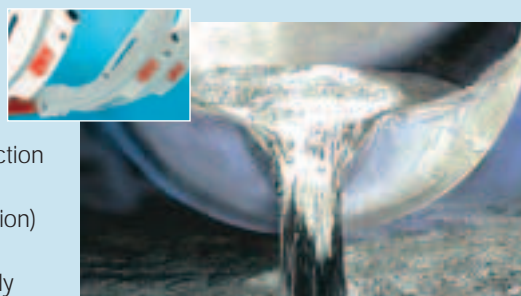
Integrated power solutions

ABB is supplying a complete integrated power solution for the 360-pot Sohar aluminium plant in Oman, which will have a production capacity of 360,000 tons, making it one of the biggest aluminium potline in the world when it goes onstream in March 2008. Sohar is a joint venture between industry and regional leaders Oman Oil Company, ADWEA (Abu Dhabi Electricity and Water) and Alcan.

ABB's scope of supply includes five giant 113 kA / 1650 VDC rectifier transformers -

the most powerful ever built, each weighing more than 300 tons - five AC 800PEC high-speed control and protection units for the rectifiers, a level-2 SCADA (Supervisory Control and Data Acquisition) system for the rectifier station and gas insulated substation, and ABB's recently launched and award-winning fiber-optic current sensors (FOCS).

The Sohar aluminum plant is part of a massive greenfield industrialization project in Oman to establish alternative sources of



revenue to oil and gas. In addition to the smelter, the project includes two steel plants and a chemicals plant, all of which will be located 12 kilometers inland from the port of Sohar.

Global robotics HQ in China



ABB formally opened its global robotics headquarters in Shanghai, China in line with its philosophy of being close to fast growth markets. This makes ABB the first multinational to locate a robotics headquarters in China. About 400 people will be employed at the location and adjacent production plant will produce 1,200 robots per year to cater to a wide range of industries.

The International Federation of Robotics predicts that 20 percent more robots will be installed in Asia between 2006-09 than in both Europe and North America. ABB's robotics headquarters was formerly based in the United States. Apart from China, ABB's production and assembly of robots is carried out in five other countries: France, Germany, Norway, Sweden and the U.S.

Offering complete building solutions



ABB was recently awarded a contract by the Chettinad group for providing climate control and integrated Building Management Systems (BMS) for their new hospital and research institute at Chennai. The Chettinad group is an 850 crores business group with interests across manufacturing, services, trading, power generation, plantation, farms and logistics among other areas.

The planned hospital complex will be spread across 85 acres and will house a medical and dental college as well as four hospital blocks with a 1500 bed capacity and 20 Operation Theatres. The project encompasses supply, installation, testing and commissioning of a 800 TR air conditioning plant comprising of 2 Water cooled Centrifugal chillers, a secondary

chilled water pumping system including the chilled water distribution network, Air Handling Units, fan coil units and Air Distribution. ABB's scope also includes supply, installation, testing and commissioning of an integrated Building Management system (BMS) for the hospital as well as the supply of a 11 kV HT Breaker.

Reliable power with outdoor RMUs



ABB India will help secure Chennai city's energy requirements by supplying 302 Outdoor Ring Main Units (RMU) to TNEB

(Tamil Nadu Electricity Board). The first unit was formally commissioned at Wallace Garden, Chennai on 5th April 2006. The RMU units will replace the feeder pillar structures which support the off-load isolators for sectionalising in and around the metro city. These will minimize downtime and help ensure reliable power supply to the city.

In related successes, ABB has also bagged orders for supply, erection and commissioning of 104 Nos of 22 & 11 kV Outdoor RMUs from GUVNL (Gujarat Urja Vitran Nigam Ltd) and 46 units from UGVCL (Uttar Gujarat Vj Company Limited).

Advantages of Outdoor RMU

- Front termination
- Remote access
- Compact design with minimal moving parts
- Option of multiple configurations
- Enhanced safety
- Low maintenance
- Ability to be upgraded with advanced communication systems such as GSM and radio connectivity via an RS232 interface

Bringing power to rural India

ABB is executing a turnkey project that will provide nearly 50,000 families in the Bhilwara district of Rajasthan, access to power. As part of the project, awarded by Power Grid (PGCIL), ABB will facilitate electrification of over 100 villages and nearly 620 habitations in the district. The grid is part of the local state distribution company AVVNL (Ajmer Vidyut Vitaran Limited).

The scope of the project includes supply & installation of 11 kV Single phase, AAAC/XLPE insulated conductors, LT Single phase aerial bunched cables, ABB 16kVA Single phase distribution transformers (1427 nos.), PSC poles and nearly 50,000 service connection meters. The project is



part of the RGGVY (Rajiv Gandhi Grameen Vidhyutikaran Yogana) scheme for promotion of rural electrification launched by the Government of India. As part of the RGGVY, the Ministry of

Power aims at providing electricity to all villages in the country by 2010.

ABB is actively involved in this rural electrification programme and is executing similar projects with Powergrid at Bankura district of West Bengal and at Azamgarh district of Uttar Pradesh among others.

Metering water flow



The Surat Municipal Corporation, in Gujarat, has selected ABB AquaMaster flow meters for the supply and distribution of potable water to people in the municipality. The turnkey project includes supply, installation, commissioning and operation of the flow metering system. ABB's AquaMaster, with its reliable battery powered operation, is ideally suited for use in remote areas where continuous

power supply is an issue. Its innovative design enables combined measurement of flow & pressure including Data Acquisition & Telemetry capabilities. Another key feature of the AquaMaster is its ability to deliver accurate measurement even at extremely low flow rates, when compared to its mechanical counterparts. The AquaMaster solution has also been installed in West Bengal, Karnataka and Tamil Nadu

Reliable, safe & maintenance free power

ABB in India has received an order from TATA Steel, one of the world's best known steel producers, for 34-36 kV GIS panels of type ZX2 and ZX1.2 to be installed at the company's Jamshedpur plant. The ZX-family of medium-voltage Gas Insulated Switchgear (GIS) comes as readymade panels with an innovative plug-in technology that lets users interconnect several units, four times faster than with conventional panels. These innovative GIS panels enhance reliability of power supply and safety apart from a space saving of over 50% as compared to conventional panels.



ABB India receives Star MNC Award



ABB has been rated as 'Star MNC 2005' by Business Standard, one of India's leading financial dailies.

Ravi Uppal, VC, MD & Country Manager ABB India, received the prestigious award from India's Union Finance Minister PC Chidambaram at a glittering function held in Mumbai. In his eloquent address, Finance Minister P. Chidambaram, lauded the spirit of entrepreneurship and commended the achievement of the winners. "As we honour India's 'Best of the Best' it is time for corporate India to benchmark global leaders, in an increasingly competitive world. The Indian government is committed to continue on the path of reforms and the building of the Indian economy must continue uninterrupted" he said.

"As a pioneer of the 'think global - act local' philosophy, ABB is a global leader operating in more than 100 countries and is very much 'at home everywhere'. Diversity and multi-culturalism are embedded in the company's basic culture and business approach, regardless of where we operate. In fact, to drive home this point, ABB is moving away from the Made in India, Made in USA ideology to a 'Made in ABB' philosophy - a true indicator of globalization in an increasingly borderless and networked world," said Ravi Uppal in his acceptance speech.

India Calling!

Fred Kindle President and CEO, ABB group visited India for the second time in 18 months to reaffirm ABB's commitment to growing its operations in India. Kindle announced the establishment of a new Low Voltage Distribution Electricals Unit in Haridwar and a Vacuum Interrupter plant in Nashik. Fred Kindle inaugurated new units for LV motors and control products at Bangalore. He also inaugurated ABB's global Operation & Engineering Center in Bangalore. The main focus of the center is to develop and execute system and engineering solutions for ABB's global automation business and serve as a resource base for ABB units around the world. "ABB's investment programme in India is on course, and we will continue to expand both our capacity and product range as required," he said during his visit.



"India is on the development runway, poised for takeoff. By overcoming its infrastructure challenges and unleashing its huge potential, India will take its rightful place in the emerging global economic order," he said. "India is not only a key ABB market, but an important resource base as well. It is also the hub country for the South Asia region and will play an important role in ABB's global operations", he added.

ABB India holds 56th Annual General Meeting

ABB India's 56th Annual General Meeting held on 26th May 2006, in Bangalore was attended by over two hundred shareholders. The AGM provided an excellent networking opportunity for shareholders and served as an opportunity to share with them, the performance of the company, several recent initiatives and future vision. Commenting on the exemplary performance of the company in the past fiscal year, Dinesh Paliwal, Head-Global Markets and Technology, EC member and Chairman, ABB India said, "The Company is well poised to further strengthen its leadership position across the businesses it represents. The ABB Group continues to focus on India both as a market and a key resource base for projects, products, services and R&D skills and shall leverage the Indian operations to optimise its 'global footprint' . "

"The Company is expected to continue to grow its core businesses, expand its portfolio, increase market penetration, augment manufacturing capacities and strengthen its engineering capabilities to maximise both domestic and international business opportunities. We remain committed to maximising operational efficiencies and striving to attain the highest standards of customer focus, quality, technology and innovation, productivity, corporate governance and social responsibility" added Ravi Uppal, Vice Chairman and Managing Director, ABB India.



Food Tech 2006

As part of a series of 'vertical' focused seminars, the Automation Industry Association of India (AIA), recently organised Food Tech 2006.



This symposium, attended by around 100 delegates, brought together leading Indian and international experts from the Food & Beverage (F&B) sector as well as technology specialists. They deliberated on the enhanced scope and increasing role of industrial automation technologies in helping the food & beverage industry attain international standards and become more globally competitive.

The event was formally inaugurated by the Hon'ble Minister of State for Food Processing Industries, Mr. Subodh Kant Sahai, who stressed on the fact that the F&B Industry was a sunrise sector, with immense potential for development and growth, especially in the Indian context. Presentations from industry leaders and leading technology users like Nestle, NDDDB, KRBL, HLL and EID Parry highlighted the value of industrial automation to these manufacturers of milk, milk products and staples such as rice, beverages, sugar etc.

Mr. Ravi Uppal, VC & MD, ABB India and founding President, AIA reiterated the tremendous potential of the sector and emphasized the role of automation technologies in helping the industry expand capacity, extend range, increase value addition, enhance quality, optimise the supply chain & maximize efficiencies.

Blowing in the wind

As one of Asia's fastest growing fully integrated wind power company, Suzlon provides turnkey integrated solutions in generating wind power for the world and is committed to a clean, green and healthy environment. We caught up with Mr Anagh Mukherjee to understand the secret of Suzlon's success and its plans in developing effective environment friendly 'Wind Power'.



Anagh Mukherjee

Head - Purchase

(Electrical Engineer-25 years experience with Siemens, Aeva, Crompton Greaves)

What is the potential you see for wind power in the country?

India is one of the fastest developing economies in the world. As India's economy grows in leaps and bounds with a GDP growth of 8% annually, effective power generation, transmission and distribution will play a vital role in this progress.

In this scenario non-conventional sources, particularly wind, is assuming vital importance. The potential for harnessing wind power is in excess of 20,000 MW. Capacity addition is underway in full earnest. Capacity addition rose from 1,111 MW in 2004-05, to 1,702 MW in 2005-06 - a rise of 43% in one year alone. This increase in capacity addition has propelled total capacity installed from wind in the country to over 5,300 MW as of March, 2006 according to the Ministry of Non-conventional Energy Sources (MNES), Government of India.

The 5 Gigawatt (GW) mark has been achieved a full year ahead of a timeline projected by the MNES and the Indian Wind Energy Association (InWEA) in the 'Wind Energy Roadmap' set out in 2003. Several states including Rajasthan, Gujarat, and Tamil Nadu have made great strides in capacity addition, with Maharashtra leading the way with an addition of over 600 MW IN 2005-06. India has now overtaken Denmark on the global marketplace, rising to the rank of the 4th largest country in terms of installed base in wind power.

Suzlon's wind turbines range

350kW, 600 kW, 950 kW, 1000 kW, 1250 kW 1.5 MW and 2 MW capacities

Rotor diameter choices ranging from 33m to 88m to meet specific weather and wind conditions

How is Suzlon gearing up to tap the opportunities?

Suzlon has been a dominant player in the Indian marketplace for the past decade and currently has around 40% of the market share. Suzlon Energy Limited has added over 1,200 MW of the total 1,702 MW capacity added in 2005 - 06 in the country. Wind energy today, in addition to contributing towards the nation's energy needs, has also helped socio-economic development. Wind energy alone has created over 15,000 jobs directly and 35,000 jobs indirectly, across the country.

Suzlon is well poised to take advantage of the market opportunities in India. The company has aggressively implemented a backward integration strategy to establish positive control over the supply chain and enable the company to respond flexibly to market dynamics. Suzlon's leadership has leveraged strategic alliances and acquisitions the world over, to bring the best components and capabilities from across the world to the design, development, manufacture, operation and maintenance of Suzlon turbines. We are currently in the process of using tube towers that take less space and easier to transport than the current lattice structures in use today. The tube towers used to be imported but, now we are in the process of manufacturing it in India.

Our customers are predominantly private entrepreneurs and industry. With wind power our customers are in a position to positively impact the environment, generate earnings, derive tax benefits and contribute to the power needs of the country. Our biggest site is in Maharashtra and is currently the biggest in India and Asia with a capacity of 1500 MW. We are looking at expanding our India footprint in Madhya Pradesh, Andhra Pradesh and Kerala.

What are the challenges in developing wind power and integrating with mainstream power distribution?

While there are several challenges on the road to the development and mainstreaming of wind power, the current environment in the economy at large, and the power sector in particular, has all stakeholders working together to find constructive solutions to issues.

Each stage of development brings forth its own unique set of challenges which range from availability of land at windy sites to road and power evacuation infrastructure to enable the setup of a wind park. Challenges may also arise from grid availability, peak load times vis-à-vis peak production times and macro issues like grid compatibility and tariffs. However, given the seriousness of power shortages and the pace of increasing demand, there is a clear recognition of the need to give wind energy and other renewable energy sources a platform alongside conventional power.

ABB equipment for Suzlon

- Low Voltage Components : (LPD and High Rating contactors)
- 33 kV Outdoor Breakers
- 220 kV CT
- Control Relay Panels
- Power Line Communication Systems

Capacity addition does depend primarily on the sites and the wind the sites receive through the year. Currently one wind mill can deliver a maximum of 2MW of power. If we need to increase this to the near 5MW levels, we will need to move offshore, which is an expensive proposition and a thorough Cost Benefit Analysis is being conducted.

What role do state-of-the-art automation and power technologies play in harnessing wind power effectively?

Wind energy is a highly technology-intensive field. Today's wind turbine manufacturers combine cutting edge aerodynamic design, advanced electrical engineering, and sophisticated IT capabilities to produce advanced, high capacity wind turbine generators. Cutting edge automation technology has become an imperative in modern wind turbine design due to the increasing size and scale of operations. Today's wind parks often span several

kilometers and converge up to hundreds of machines. Suzlon already operates Asia's largest windpark and is well on its way to establish the world's largest.

Given the complexity of operations in such environments, state-of-the-art automation in every stage of the process is a key enabler to ensure effective control management and efficiency.

What is your experience of working with ABB?

At Suzlon, we use a wide range of products from ABB's comprehensive product portfolio. ABB's technology is among the best in the industry and we have received on time service and support from the company. ABB is a reputed global company and they meet our standards of exceptional quality and requirements of ontime delivery consistently.

Suzlon facts

Employees - 4000
 Global presence - 40 locations in 9 countries.

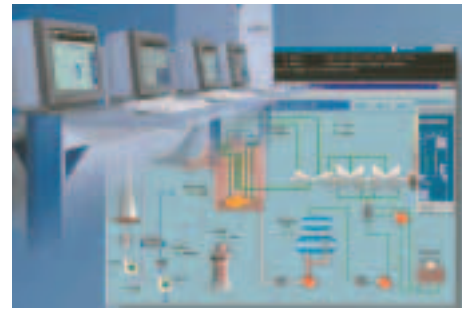
In India - Tamilnadu, Maharashtra, Karnataka, Rajasthan and Gujarat
 Production Units - 18 (Blades and structures) and 1 unit for Generator Motors
 Current Production Capacity - 1500 MW
 Current Ratings being produced - 350KW, 600 KW, 1.25 MW and 2 MW



Symphony-Harmony

NALCO's existing control system, for its 6 Units (of 120 MW each), power plant is being renovated and modernized with ABB's Symphony-Harmony Distributed Control System. ABB's Control system includes FSSS (Furnace Safeguard and

Supervisory System), Turbine Control, Plant Controls and Instrumentation. The system will replace the existing hard-wired control system with single unified control system for each of the units.



FAU Flame Scanners

ABB is supplying Microprocessor based FAU800 flame scanners at NTPC's Singrauli STPS. The Flame Analysis Unit, or FAU800, is ABB's latest leading-edge flame analysis device. It is designed for maximum flexibility, usability and reliability. It takes advantage of the latest technologies available to make flame analysis as cost-efficient as possible. These have to be reliable and rugged to measure the quality of the signal and provide



an indication of changes in the burner flame. These quality values act as a barometer, forecasting when a burner flame out is likely to occur, thus indicating possible unsafe conditions. It is easy to install and configure, flexible to operate, and uses standard Modbus or Profibus interfaces for easy communication. The FAU800 will replace existing systems at 3 units of the power plant (3 x 210MW).

Plant automation with 800xA

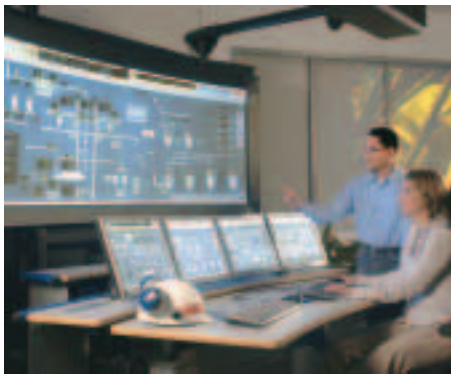


ABB is working with Fuji Electric Systems Co., Ltd in Philippines to automate the 40 MW geothermal power plant, owned by PNOC Energy Development Corporation, a subsidiary of Philippine National Oil Company (PNOC). ABB will supply its latest System 800xA for the full plant automation including turbine area, cooling tower and steam receiver areas. The scope also includes performance calculations for plant performance and efficiency monitoring as well as ethernet interfaces via IEC 60870-5

to remote terminal units (RTU) as part of PNOC's transmission network and SCADA interface for communications to the National Load Dispatch Centre. ABB has also been selected to supply the control system and related services for Lahendong II geothermal power plant in North Sulawes, Indonesia. ABB is responsible for project management, system engineering, installation supervision and commissioning for the 20 MW power project.

Plant upgradation with MV switchgear

ABB will design, manufacture, test, install and commission the new medium-voltage switchgear and protection technology for two 1,200 megawatt power plants owned by the South African utility, Eskom. The upgradation is for two of Eskom's power plants, namely Kriel and Grootvlei.

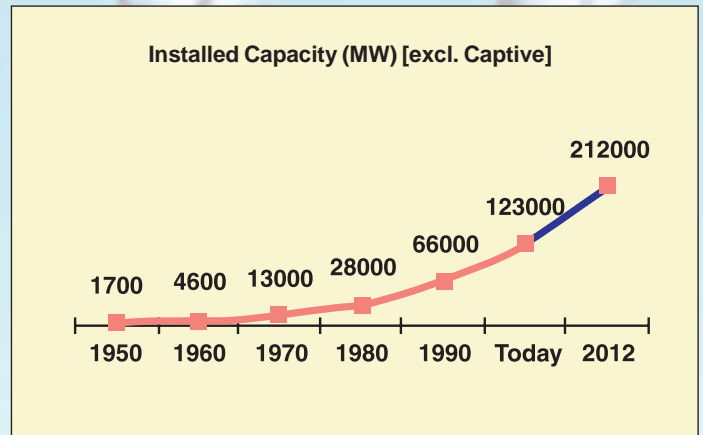
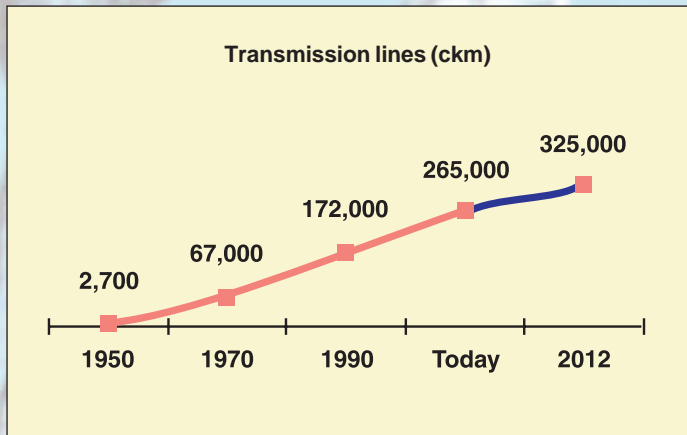
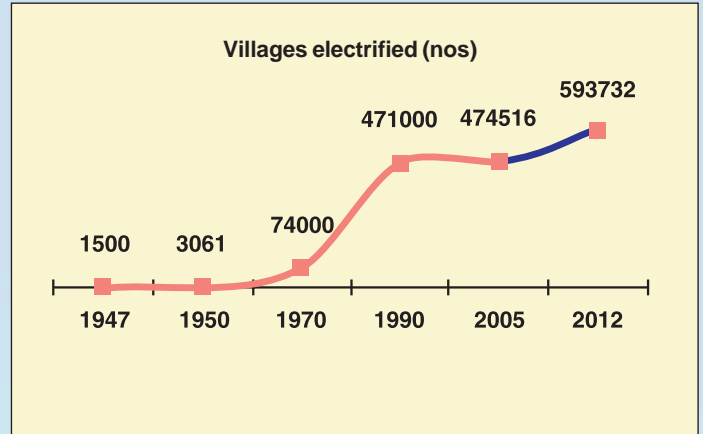
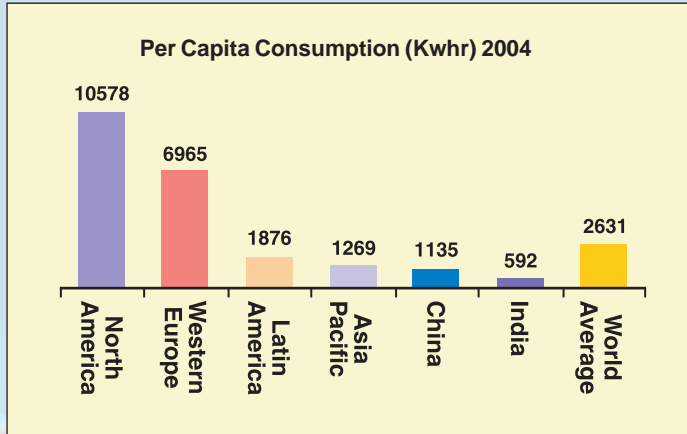
The Kriel agreement also includes generator and transformer protection systems, so the



plant can continue to operate in the event of faults and abnormal service conditions. ABB will initially install around 500 switchgear panels at the Kriel station, and 300 panels at the Grootvlei station. Grootvlei was commissioned in 1969, Kriel in 1979. The overall refurbishing of the plants will extend the operational life of each by 20 years.

Powering ahead!

When India achieved independence in 1947, the country had an installed capacity of 1,360 MW. The present installed generating capacity in the country is close to 130,000 MW. Inadequacy of capacity continues to plague the power sector in India. To provide availability of over 1000 units of per capita electricity by year 2012, it has been estimated that need based capacity addition of more than 100,000 MW would be required during the period 2002 - 12. The outlook for the power sector is positive and growth is envisaged across the value chain - generation, transmission and distribution



Source : MOP

Capacity 123,000 MW (excl. captive 18,000 MW)

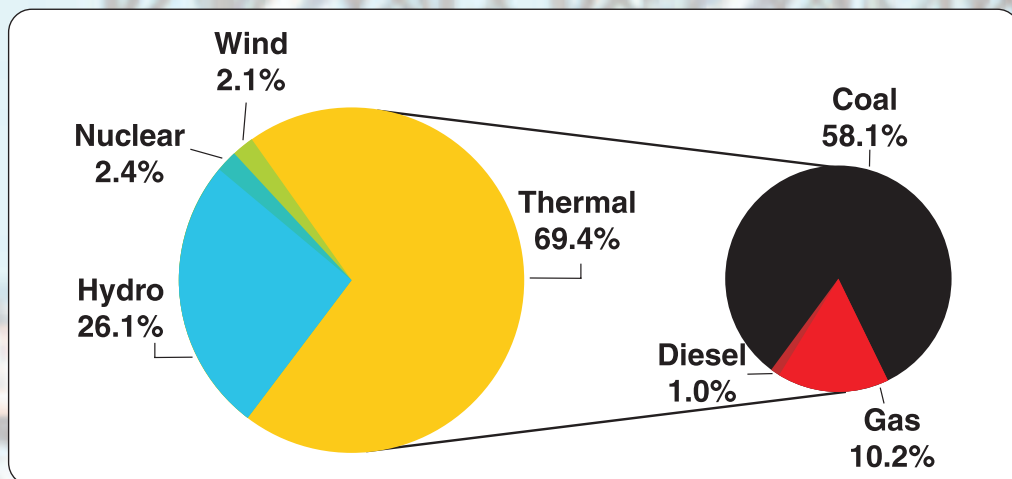


ABB offering for p

When setting up a power plant, the prime focus is to achieve the optimum mix of output, performance and costs over the entire life-cycle of the plant, while maximizing the return on investment. An integrated solution provides exceptional benefits when compared to a multiple supplier solution.

ABB has the engineering capability, experience and technologies to deliver "turnkey" system integration of Plant Electricals specifically tailored to different power plant types, such as oil & gas fired combined cycle power plants, coal fired boiler power plants and hydro power plants as well as industrial sized turbine and boiler power applications.

Power Generation offerings

■ Power Plant Automation

- Instrumentation
- Distributed control systems
- Boiler and turbine control

■ Plant Electrical Systems

- MV & LV electrical systems
- Excitation, protection and synchronization
- Motors and drives

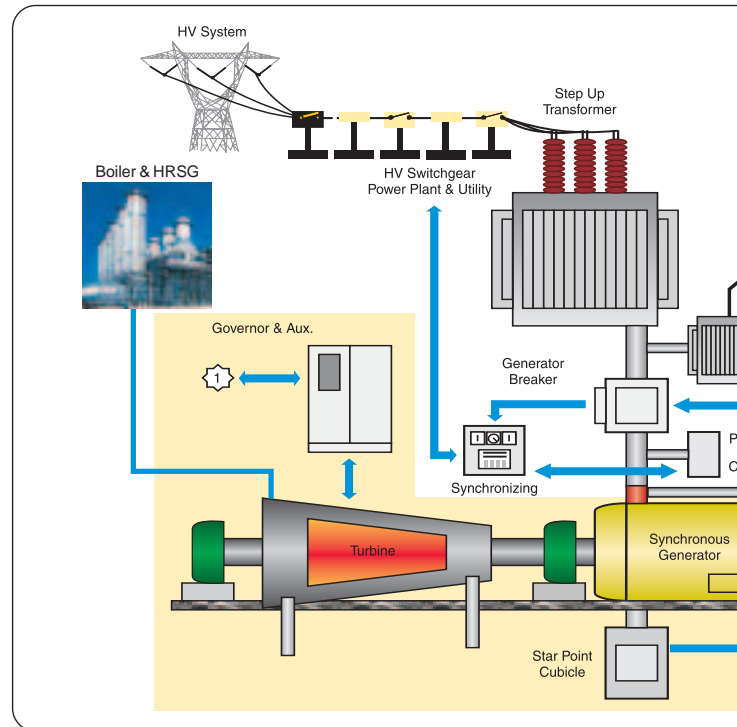
■ Plant Management and Optimization

- Plant operations and maintenance
- Optimized communications
- Environmental monitoring and control
- Asset lifecycle management

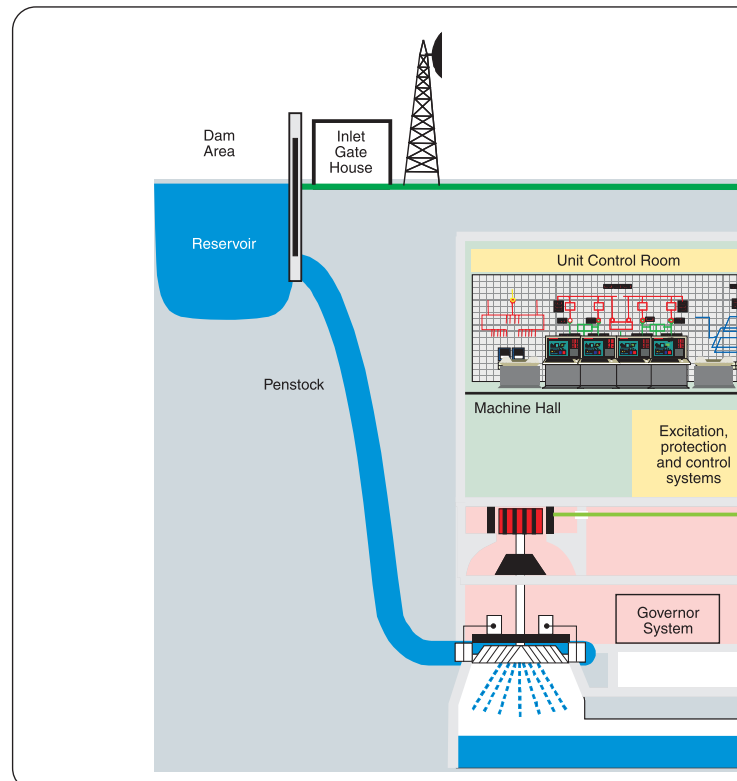
■ System Integration

- Project development
- Engineering and consulting
- Erection, commissioning

Thermal Power



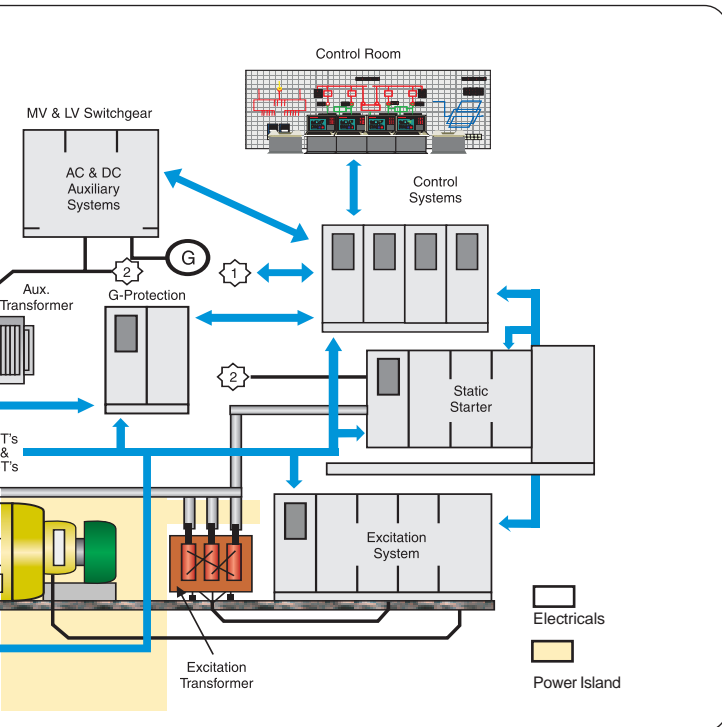
Hydro Power



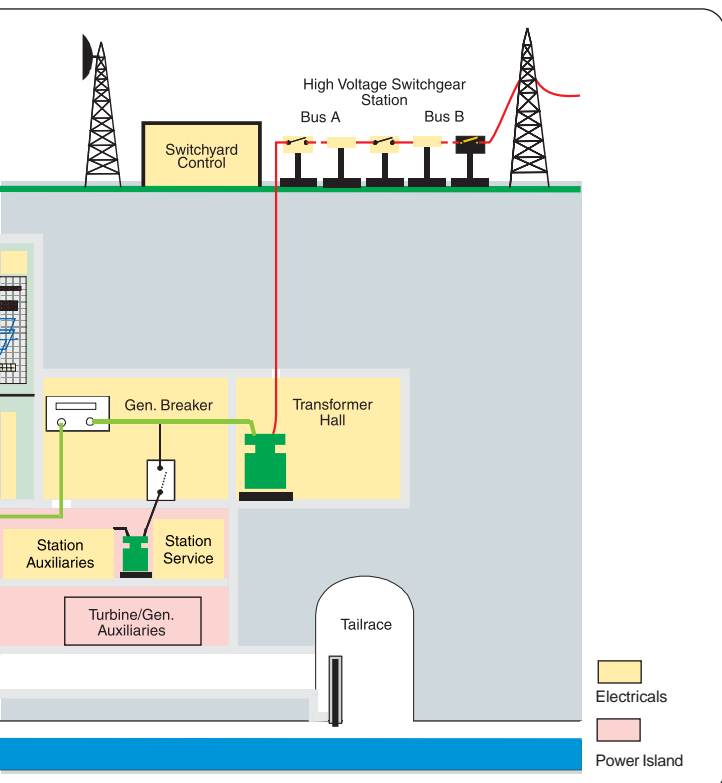
power generation

ABB offers a comprehensive range of solutions for power plant management and optimisation with one main objective of providing the best performance and lowering environmental impact. The scope of supplies and services covers the entire spectrum of automation technology, field instrumentation and electrical auxiliary equipment, control systems, communication solutions, systems for process and plant management, and plant optimisation. Through innovative electrical power applications ABB assists utilities to build and maintain reliable power system installations safely and efficiently, offering cost effective solutions.

Power Plant



Power Plant



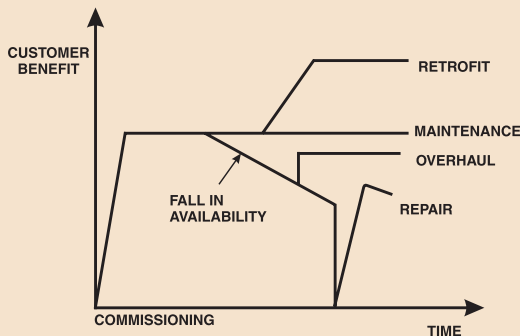
A single window approach

- Boiler control – Burner Management systems, flame scanners
- Turbine controls – Governor control, protection and condition monitoring
- Generator circuit breaker and bus ducts
- Generator, station and auxiliary transformers
- High voltage substations – air & gas insulated solutions
- Medium and low voltage distribution systems including switchgear and auxiliaries
- Power and control cables
- Power plant electrification
- Voltage regulation and excitation system
- High & low voltage motors and drives for pumps
- Controls and instrumentation including open loop, close loop, data acquisition systems and turbine automation; integration of DCS, boiler and turbine controls and environmental monitoring systems.
- Disturbance and event recording systems
- Communication solutions for voice and data
- Tariff metering system
- Civil works associated with switchyard HV substations
- HVAC
- Static starter systems

Retrofit solutions for Medium Voltage equipment

With fast increasing demand for power, aging equipment is often subject to stringent loads beyond their rated values. The equipment also has to ensure reliability conforming to latest standards, meet increasing fault levels and be compatible with data communication systems. Often there is no choice but to upgrade. It is always not possible to replace old equipment due to shutdown constraints & cost factors. It is therefore becoming increasingly important to look for alternate optimised solutions such as Retrofit.

Typically, retrofit constitutes replacement of vital parts of an equipment having similar or advanced features for restoration, functionality, reduced maintenance & life extension. This further extends to upgradation & modernisation of basic equipment and allied parts. ABB recently completed execution of retrofitting 73 11kV Minimum Oil Circuit Breakers with the latest technology Vacuum Circuit Breakers for APGENCO at the Vijayawada Thermal Power Station. The retrofitted switchgear offers far greater system reliability, personnel safety and long term availability of spares with minimal investment and down time.



Advantages of retrofitting

- Availability of new technology
- Low investment - 60-70% of new installation
- Increased personnel safety & reliability
- Less shut down / outage
- No change of location - foundation not disturbed
- Re-routing of power / control cables not required,
- Minimal engineering & administrative co-ordination
- Long term availability of spares
- Life extension as good as new



One to one retrofitting solution for MOCB Breaker with ABB SF6 Breaker Type - HPA 12/1640

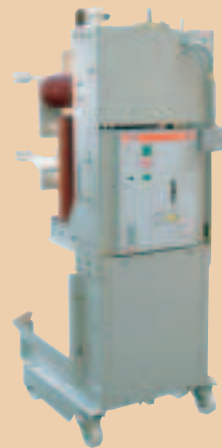


ABB Vacuum Circuit Breaker Type - VD4 12.12.25 as one to one retrofitting solution for MOCB Type - HKK 12/1240

Scope of MV Retrofit

- Provide new technology circuit breaker for one-to-one replacement only of circuit breaker or a larger scope covering other problem areas of the switchgear
- Uprating of panels, in terms of current rating, fault level, voltage etc.
- Conversion of fixed type circuit breaker to draw out type, circuit breaker to contactor, transformer feeder to motor feeder etc.
- Modernisation of protection relays

Methodology

- Study of present performance requirements
- Study of the installed equipment to assess suitability for present demands on performance
- Identification of problem areas and identification of solutions with modern products & technology
- Proposing appropriate solution for performance enhancement with environmental compliances
- Install new selected alternative keeping down time and costs to a minimum



Make light work of DC current measurement

ABB's FOCS is a family of high accuracy fiber-optic current sensors developed for measuring high DC currents. Based on the magneto-optic effect (Faraday effect) in a single-ended optical fiber around the current conductor, the FOCS can measure uni- or bidirectional DC currents up to 500 kA with an accuracy of 0.1 % of the measured value.



Key product features

- Compact design for fast and easy assembly, installation and transport
- Immune to electromagnetic interferences due to optical measurement and therefore no need of magnetic centering, busbar studies or subject to saturation effects which reduce the accuracy
- High accuracy of 0.1 % of the measured value for precise plant efficiency calculation
- No special building structure for the protection and housing of the sensor
- Optical current measurement for galvanic isolation of the system and low power consumption
- Easy and flexible

Working faster & better with an integrated grid



ABB has found a way to integrate geographical information and maintenance management systems so that operators can rapidly pinpoint any component in a grid, and quickly access maintenance information. Similarly, maintenance staff receiving a work order via the CMMS can view the geographical information on the map to find the exact location of the device in question. Locating a single component within a huge grid can be like looking for a needle in a haystack, so the benefits of integration are immediately apparent. Operators are able to rapidly locate widely dispersed devices, such as transmission towers, and by accessing their maintenance data, determine if work needs to be done on them.

Rapid, reliable defect classification

ABB has developed a new software tool for paper and rolling mills that makes the selection of classifier training data faster and more reliable. The neural network based tool is called Defect Viewer. For the first time any incoming defect detected by a web imaging or surface inspection system can be classified efficiently and automatically.

For neural classification to succeed, a substantial amount of training material is required. Defect Viewer uses a powerful Self Organizing Map (SOM) algorithm that automatically matches a defect with images of similar defects in the database. The user can then label the defect with the correct class name to create the required training material. With the substantial body of training material to work from, the classifier of the web imaging or surface inspection system is then able to automatically classify each incoming imperfection in the paper or sheet metal. Once the defect has been classified, its probable cause can be identified and a decision made as to whether remedial action is necessary.



Leaner, fitter, smarter



Optimizing the trade-off between profit, asset lifetime and emissions to improve energy efficiency in the power generation industry

Power plant operators are under constant pressure to improve plant performance, availability and maintainability, reduce emissions and costs while delivering power at competitive market prices.

ABB is sensitive to these challenges and is aware of the customer's need for a comprehensive solution. Providing a suitable solution has been made easier because technological advances in the areas of control and software engineering have led to the development of innovative plant optimization systems.

Accurately monitoring and predicting plant performance involves more than simply calculating the expected power and efficiency of the plant.

Today's systems are capable of taking the lifetime consumption of equipment into account so that different load profiles can be optimized. Hence, plant optimization systems are a "value-adder" because they can significantly increase the economic efficiency of a plant and reduce plant emissions. ABB's contribution is the OPTIMAX™ Plant Optimization systems. These are decision-support tools which continuously assess plant condition and provide root cause analysis in case of deviations. The OPTIMAX™ Plant Optimization systems are at their most powerful when they are combined together so that true predictive maintenance and effective repair is performed before what could otherwise be a costly shutdown. Some of the systems included in the overall

OPTIMAX™ portfolio are described in the following paragraphs.

Performance monitoring

Before any kind of optimization and control decisions are made, plant managers need to know how efficiently their plant and equipment are working. Regardless of a plant's age, a major portion of a power plant's lifecycle costs is attributed to fuel and operation, whereas maintenance represents most of the remaining costs. Minimizing these costs and improving predictive maintenance are the key objectives of the operation and maintenance staff.

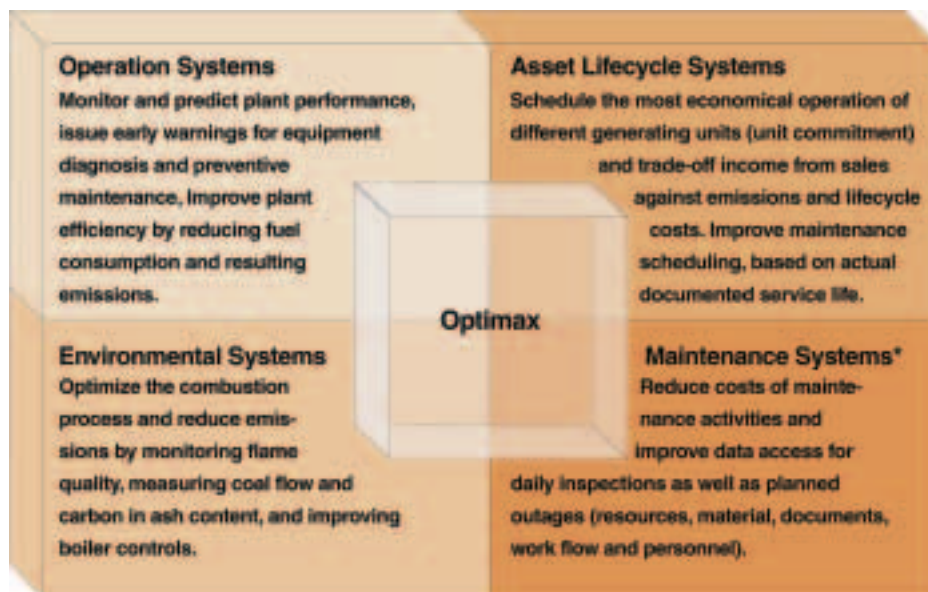
Faced with the ever-increasing competitiveness of today's global markets, companies in the utility industry are constantly striving to optimize plant operation and lifecycle costs, and reduce emissions. They search for powerful diagnostic and optimization tools to identify performance deviations so that corrective action can be introduced early.

In addition, these tools should reduce the maintenance effort for all plant equipment, extend the life of critical capital equipment and increase the utilization of the existing asset base, thus improving total plant availability and productivity.

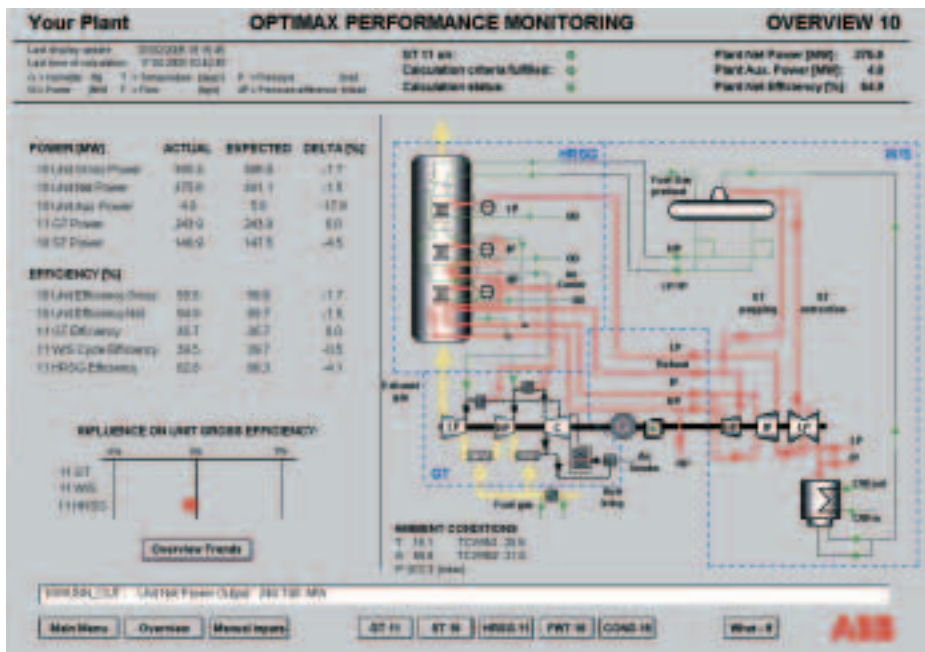
In electric power generation, ABB's OPTIMAX™ Plant Optimization systems give power plant managers a number of perspectives with regard to the efficiency and expected performance of assets such as boilers or turbines.

To help them achieve these objectives, OPTIMAX™ Performance Monitoring system is an application designed for performance monitoring of the plant and its equipment. It facilitates online or offline analysis of the process so that the user can determine how current operating conditions affect, for example, the plant heat rate and therefore plant fuel costs.

A system of this type is based on steady-state calculations and can run cyclically or on-demand. Its main task is to calculate deviations between actual and expected plant Key Performance Indicators (KPIs) at current operating conditions.



Plant optimization systems within the Optimax™ solution suite. *(Maintenance systems are not covered in this article).



A typical OPTIMAX™ performance display.

The task of accurately monitoring and predicting plant performance, however, involves more than simply calculating the expected power and efficiency of the plant. The calculation of detailed performance values (pressures, temperatures, flows, etc.) at several hundred locations throughout the plant has become a standard requirement. Short- and long-term equipment degradation of individual components can only be recognized if deviations from the best achievable (expected) efficiency levels are clearly identified.

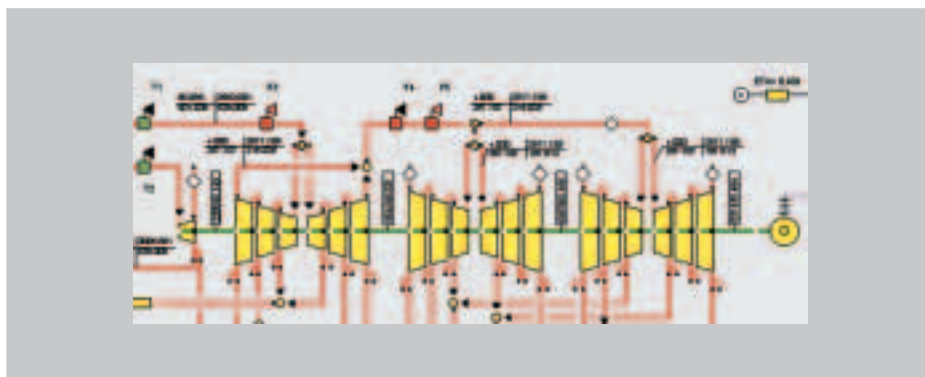
This can be achieved by using Performance simulation models. These are thermodynamic models which accurately simulate the performance behavior of the plant under varying ambient and different steady-state operating conditions. Such simulation models, as shown in , can be easily designed using the OPTIMAX™ PowerCycle tool to compute the expected plant equipment process values at current



Data Validation before doing performance calculations.

operation mode. The results are then used to determine the expected KPIs. As an additional benefit, PowerCycle can also be used for "what-if" calculations so that optimal operating strategies can be developed.

Unfortunately, measurement inaccuracies - caused by stochastic or systematic errors - are usually the reason why consistent mass and heat balances cannot be compiled for single components or the entire plant. Such balances can only be obtained by correcting the measured values in such a



Detail of a PowerCycle plant simulation display.

way that they do not contradict the relevant energy balances. The systematic computation of such corrections is known as Data Validation (or Data Reconciliation). In other words, Data Validation improves the reliability & accuracy of the performance calculations.

A precondition for this type of calculation is an exact model of the plant, such as the performance simulation model described above. A large number of measured values are therefore connected to this model in addition to the measured data needed to perform the simulation . When Data Validation is included, the simulation model not only provides a set of consistent thermodynamic balances, but it also allows for the identification of sensor failures, sensor drifts and/or loss of equipment efficiency.

Optimization strategies merely based on human know-how have become insufficient for companies operating multiple generation or co-generation units.

Resource optimization

Power generation companies, municipalities, industrial power plants and desalination plants need a sound basis on which to trade energy on the open market. Optimization strategies merely based on human know-how have become insufficient for companies operating multiple generation or co-generation units.

The OPTIMAX™ Unit Commitment system combines fully developed asset and market models with the latest optimization techniques. This system can handle utilities with complex generation portfolios which are seeking to optimize their costs and energy generation, be it electrical or a combination of electrical and other forms of energy (heat, hydro, waste, etc.). In addition, deciding whether or not it makes sense to buy or sell power or fuel, start or stop a unit, save lifetime, or postpone a preventive maintenance outage can be easily answered. Using state-of-the-art numerical solvers, this application minimizes the total generation costs of a power company by scheduling the energy load between different units - known as Unit Commitment - to satisfy load demands in the most economical way.

This optimization system typically runs in offline mode to determine the effects of certain what-if scenarios and train personnel in its effective use.

It allows the analysis, planning and scheduling of multiple generation units over

different time horizons, i.e., from several hours to several months .

In general, when an optimizer determines the most economical load profile of plants based on generation costs and revenues from energy sales, two important cost factors are still missing: those attributed to lifetime consumption and emissions.

Under the umbrella of Resource optimization, OPTIMAX™ Lifecycle Optimizer [1] addresses the influence of operating modes on the full cost of running a power plant and includes this in an economic optimization model. The optimization scope includes energy sales, production and emission costs, as well as plant ageing based on lifecycle models. It uses parameters such as power prices and emission credits or penalties (which will be reduced to mere commodities in the future) calculated against long-term maintenance costs to optimize economic plant performance. The advantage of the Lifecycle Optimizer is its ability to include plant ageing models to find the optimal operational strategy between maintenance outages. This solution clearly shows its advantage in terms of Return-on-Investment and profit increases of several percent.

The new emissions regulations, in particular within the EU, will have a substantial impact on the profitability of today's power plants. If a plant emits less than the level of its emission allocations, it can sell the additional permits to others that may have emitted more. If a plant emits more, then it needs to purchase additional permits or pay a penalty. The added value of the Lifecycle Optimizer is that it can assist plant managers in finding a trade-off between short-term profits and long-term asset costs, especially when operating under environmental constraints.

Energy efficiency in power generation, distribution and consumption is fast becoming a priority in the global battle against greenhouse gas emissions. ABB's Combustion Optimization solutions will continue to help power plant operators around the globe to improve operating efficiency.

Combustion optimization

The combustion processes in gas- or fossil-fired power plants are very complex. OPTIMAX™ Combustion Optimization system, however, helps power plant managers optimize their combustion process and reduce emissions by:

improving boiler controls; monitoring flame quality; and measuring coal flow and carbon-in-ash .

A unique characteristic of the software is its ability "to learn" and "predict" trends, resulting in reduced response times to changing conditions.

Improving boiler controls

Before energy market liberalization, large fossil-fired power plants were mostly operated at base load with few or no plant shutdowns during the year. Today an increasing number of these plants often operate at part load, and frequently shut down because of market prices and trading decisions. As a consequence, the issues of start-up costs, energy losses, and emission control have gained in importance.

This is where ABB's 'Dynamic Optimizer' application comes in. With this tool, it is possible to solve optimal control problems in closed-loop. It can take existing constraints into account as an inherent part of the control variables. This "dynamic" capability is an improvement when compared to conventional solutions which often require extensive modifications to control system functions when constraints change.

An example of an application where Dynamic Optimizer has been implemented is the *BoilerMax* solution for the optimization of a boiler start-up [2]. BoilerMax was developed by ABB to enable all of the advantages of uniting model-based closed-loop control and IT to be applied to steam generators in large power plants. For a typical 700 MWe coal-fired plant which frequently shuts down during the year, this solution minimizes

start-up times and reduces emissions with total cost savings of up to 10 percent.

Monitoring flame quality

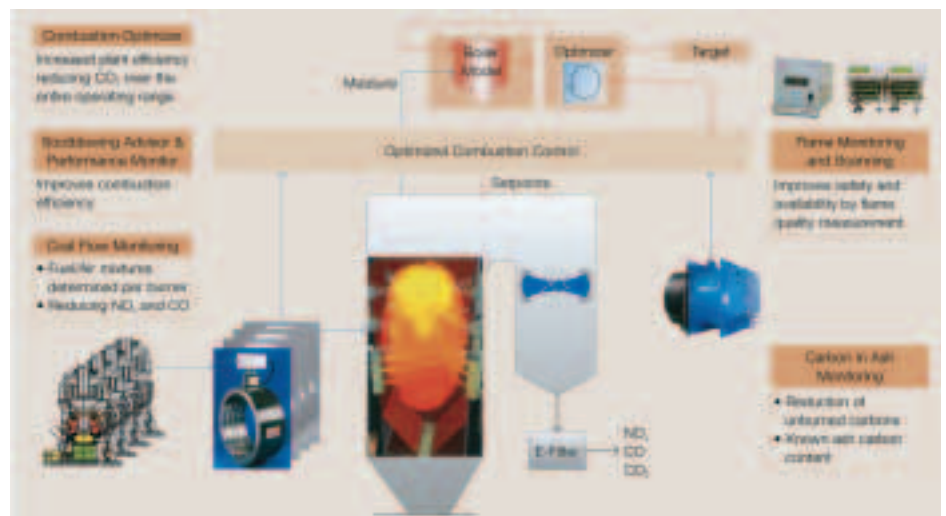
Flame scanners are a crucial part of a combustion safety system. Their primary function is to identify potentially dangerous "flame-out" conditions where ignition has ceased and the continued addition of fuel could cause an explosion. Because of their importance, flame scanners must be extremely reliable and rugged to measure the quality of the signal and provide an indication of changes in the burner flame. These quality values act as a barometer, forecasting when a burner flame-out is likely to occur, thus indicating unsafe conditions & problems.

ABB's flame scanner and igniter technology has been reliably in use for many years on boilers and gas turbines. The development of these instruments and their corresponding software solutions has allowed plant owners to continuously reduce emissions and to follow the path of environmentally friendly operations.

Reducing emissions by measuring coal flow and carbon-in-ash

OPTIMAX™ model predictive control (MPC) solutions can optimize boiler efficiency and help reduce NOx emissions. It is a generalized multi-variable, dynamic controller and optimizer and uses dynamic feedback to update the models. This system characterizes and quantifies the effects of operational parameters on the efficiency and emission of a power generation unit [6].

Critical variables influencing the heat rate are excess O2 and the exhaust gas temperature. On the other hand, NOx is strongly influenced by the flame temperature.



A typical Optimax™ optimization configuration window.

Heat rate and NOx models are developed from test and historical data utilizing inferential models. The models are then used to continuously determine the combination of set points and/or biases to achieve the most economical operating condition. Past projects have reached up to 0.75 percent efficiency improvement while maintaining emission limits, thereby providing a return on investment of between 1 to 2 years.

A typical coal-fired power plant can produce up to 500 tonnes of fly-ash in a single day. If this fly-ash contains too much carbon (unburned coal), it must be disposed off - usually in large costly landfills. By employing ABB's Carbon-in-Ash monitor with its closed-loop control, utilities can now produce high quality, low carbon fly-ash which can be used as a primary constituent of gypsum wallboard and blended cement. This non-extractive monitoring system incorporates advanced microwave technology for the continuous and accurate measurement of carbon in fly-ash. In fact it is the only measurement system of its kind that can be integrated into a closed-loop optimization control system [3].

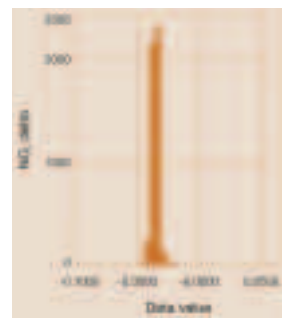
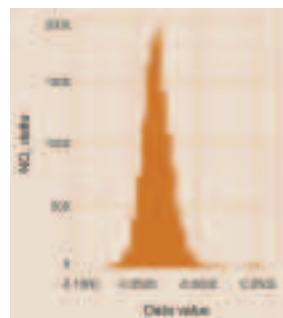
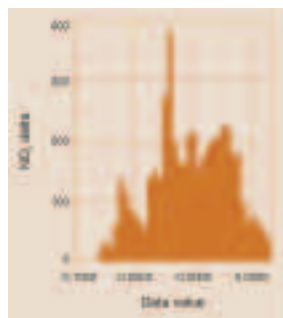
The use of fly-ash in cement production also results in a significant reduction of harmful emissions. But this isn't the only advantage for a utility: improved coal combustion and fly-ash sales from a large power plant can yield an annual return of up to \$1 million.

Heat exchanger surfaces inside boilers continuously degrade due to fouling caused by soot. Because of this, it is necessary to use soot blowing cleaning techniques to recuperate these losses as much as possible. Although soot blowing is a necessary cleaning procedure for boilers, it temporarily decreases boiler efficiency. When this process is optimized, however, long-term plant performance is increased.

The OPTIMAX™ Soot Blowing Advisor calculates online sectional surface cleanliness values as well as the temperature of gas entering each boiler section. The model is configured and tuned to unit-specific boiler data. The results obtained from this module support plant operators and engineers in optimizing the current plant soot-blowing scheme, and can translate into significant fuel savings.

Parameter estimation for diagnosis and optimization

With advances in controls and software engineering, the use of process simulation



Reduction of NOx emissions variability through optimized combustion control.

has become a crucial element for assessing plant performance. The usefulness of such systems, however, strongly depends on the ability of the simulation model to represent the plant equipment properties. Having accurate models representing a large range of operating conditions is a very challenging and largely unsolved problem. Indeed, even in cases where the technical processes are well understood - as is the case in power plants - the models remain parameterized by a number of unknown or hard-to-measure quantities such as heat transfer coefficients, thermal inertias, and turbine and compressor characteristics.

Parameter estimation is a technique that has produced powerful modeling methods and tools (based on collected data) that are particularly useful in power plant optimization. For example, parameter estimation is used to estimate the natural degradation in gas turbine compressors and to optimize online and offline compressor washing cycles [4]. When compared with traditional scheduling methods, the resulting maintenance schedules clearly show the achievable economic benefits, especially for plants that are in continuous operation. In addition to this, the method can also be used for improving equipment diagnosis and quantifying the accuracy - and hence the risk - of the diagnostic results.

For example, the OPTIMAX™ Gas Path Diagnosis tool determines the probability of compressor fouling and turbine erosion, thus improving preventive maintenance actions and reducing overall costs.

Increased operator efficiency can be directly translated into cost savings in the form of optimal plant operation.

The same MPC based technology for optimization used in combination with the parameter estimation toolbox has been successfully applied by ABB in other industries. In the cement industry, for example, this approach has generated

thermal and electrical energy savings of up to 5 percent as well as significantly reduced emissions and maintenance costs [5].

Operator training simulators

The best power plant operators know when to react, what to do, and how to do it. This ability comes from years of operating the plant in a variety of normal and abnormal operating conditions, as well as from knowledge about the process and the control system.

ABB's Operator Training Simulators (OTS) are used to train new plant operators, and refresh and deepen the knowledge of experienced plant personnel. Ultimately, increased operator efficiency can be directly translated into cost savings in the form of optimal plant operation under all conditions, damage limitation, decreased down time and decreased production loss.

Customer benefits

If a plant is run on condition-based maintenance, where outages are not planned at regular intervals but are dependent on the state of the plant, the success of this strategy depends on the quality of plant condition assessment. Tools for the continuous assessment of a plant's condition enable the early detection of degradation or emission violations, as well as the validation of measured data and sensor quality. Of course this helps the plant staff reduce fuel consumption and emissions, but even with a very precise plant state assessment there is room for optimization in this approach.

Performance monitoring, optimization techniques and risk assessment are central components of today's plant optimization systems. Their main task is to reduce negative surprises by quantifying performance problems and reducing emissions.

Decision makers use these systems to improve predictive maintenance, extend asset lifecycles and, most of all, to meet financial targets.

Marc Antoine

> Source: ABB Review

ABB facilitates school renovation



ABB India recently facilitated renovation projects at the Primary School in Govardhan near its Nashik Plant by rebuilding as well as providing benches and blackboards. Provisions have also been made for drinking water and toilets for girls and boys. The roofing was replaced with pre-coated sheets and



doors & windows were replaced for better ventilation. Power has been ensured for all classrooms and the school will soon have its very own garden. The highlight of this project is a new children's play area, bringing joy and fun to their precious school days.

ABB sets up technology showcase at Community Science Centre



ABB has set-up a state-of-the-art "Technology Showcase" at a Community Science Centre which mainly caters to underprivileged children from government schools and technical institutes in and around Vadodara. Three models demonstrating the processes of power generation, transmission and distribution have been installed at the Technology Room. Scale models of a thermal power plant and a range of electrical equipment for power transmission and distribution serve as useful learning aids for children. The "Technology Showcase" is part of ABB's initiative to promote and enhance the quality of primary education and contribute to the communities it operates in.

ABB strengthens bonds with IIT-D

ABB in India has signed an MOU and strengthened relations with the Indian Institute of Technology Delhi, (IIT-D) rated amongst the world's leading technology institutions. This includes multiple initiatives aimed at facilitating increased interaction between industry and academia and furthering research & development efforts in power & automation technologies.

As part of the MOU, ABB will establish a 'Professorial Chair' to facilitate technology development and knowledge sharing between ABB and IIT-D through specific development projects and general research in the sphere of power and automation technologies. In another related initiative, ABB will recognize students of exceptional talent in the field of electrical engineering, by offering scholarships to undergraduate and graduate students. These scholarships will be based on merit and aptitude to pursue studies and projects in relevant subjects. The 'ABB Scholars' will also have the opportunity to interact with the company on a regular basis as well as take up project assignments and summer internships. ABB is also interacting with IIT-D on provision of lab facilities.



Mr. Ravi Uppal (VC & MD ABB India) & Prof. Surendra Prasad (Director - IIT-D)

Vega Controls, Pune

How long have you been an ABB Channel Partner?

We have been associated with ABB since 2001 and are a partner for ABB's range of Drives and Control Products.

What are the benefits of being an ABB channel partner?

We have a very healthy relationship with the company. We receive on time customer support. Vega Controls used to manufacture drives in the past, we are therefore completely aware of the technology and USPs of ABB's drives and control products. The drives are perhaps the best in the industry and technologically superior than most products in the market.

ABB is a well known brand and we are able to significantly leverage this in the marketplace. ABB's online channel management system is also very good. We have direct access to order placement and most issues can be logged online. The system works well for us as we are also moving to a paperless office and are continually looking at ways to integrate our systems with ABB.



How has business been in recent times?

Business is excellent. In fact, we have been doubling our business every year and hope to continue with this trend. The market is good & we need to capitalize on the opportunities. We are also investing in our own infrastructure to meet the growing demands of business.

What further support would you require from ABB?

We are always thinking of ways to further our partnership. We would like to enter the Building Management Systems arena and partner for specific industry solutions as well. We look forward to an ongoing partnership with ABB and continuous improvement in the relationship to deliver greater value to our customers.

Personal Fact File



Name: Yatin Purandare
Managing Director

Age: 45 years

Family:
Wife and one son

Hobby:
Business, business and more business

Business Philosophy:
Build long term customer relationships and partnerships. Leverage technical competency to the maximum

Sai Control Systems

Sai Controls Pune, has been an ABB channel partner for four years, dealing in ABB's range of Low Voltage Switchgear. Though the initial years were tough, the last two years have been good.

Commenting on the relationship with ABB, Satish Gijare, Proprietor, Sai Controls said, "We are doing good business and are looking at growing around 25% - 30% p.a. The strength of the ABB brand, its acceptability and technology superiority helps us meet our targets and gain customer confidence."

Sai Controls has been in business for over nine years and feels that he gets the maximum benefit from the ongoing relationship with ABB. Talking about the benefits, he says, "We receive good customer support from ABB and we also use the online channel management system to track our orders. The technology

benefits of the products are outstanding and I almost never face any customer complaints on the product. The products are extremely reliable and that helps build our reputation in the market as well."

However, they would like to see shorter delivery time for products as customers tend to give a very short turnaround time.



Personal Fact File



Name: Satish Gijare
Proprietor

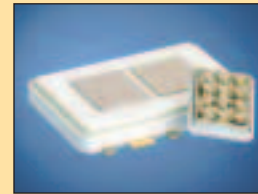
Age: 50 years

Family:
Wife and one son

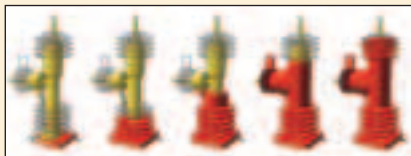
Business Philosophy:
Honesty and hardwork. Deal only in genuine products and stay away from counterfeits.

Stacking the chips

Developed and patented in the mid - 1990's, ABB's StakPak™ press - pack housing for Insulated Gate Bipolar Transistors (IGBTs) is now in its fourth generation, with a fifth upgraded version scheduled for release in the first half of 2006. StakPak™ enables the IGBTs to be stacked easily, safely and inexpensively in series connection. The key element of the module technology is a unique spring contact attached to each IGBT which ensures that the same pressure is applied to each chip, regardless of the number of modules in a stack. Uniform pressure is essential for large switching installations like HVDC Light® and SVC Light®.



Innovative insulating material



In power transmission and distribution, insulating material plays a key role, especially when it comes to achieving product life of 30 years or more. To accomplish this insulating material has to withstand harsh environments and conditions of permanent electrical field stress, mechanical load, high temperature variations, humidity and other aging processes. Two new materials technologies have recently been introduced. The first is a water- repellent epoxy. When combined with an optimized design, reclosers made of this material are far better suited for harsh outdoor conditions. The second innovation is a process improvement. It is called high speed epoxy that makes post-curing faster and easier than with standard epoxy. The total process time is reduced from hours to minutes. For customers, the benefit is shorter lead times, which is a key issue in, for example instrument transformers.

World's first field mountable videographic recorder

ABB's SM500F is a four-channel recorder that can be installed in even the most hostile environments, taking recording out of the control room and offering users localised access to operational data. A choice of mounting options means the SM500F can be easily installed onto a panel, wall or pipe without the additional expense associated with the enclosures normally required to field mount a traditional videographic recorder. Its fully sealed IP66 and NEMA 4X enclosure provides full protection against water and dust ingress, making it ideal for hosedown and dirty applications. The SM500F is ideal for any installation where local indication and recording of process conditions is needed. Typical applications include cold storage, warehouse monitoring, temperature and humidity monitoring, effluent monitoring, borehole abstraction and swimming pool monitoring.



Monitoring marine engines



ABB's Cylmate System is a revolutionary technology that continuously measures every stroke of each cylinder in the powerful diesel engines that drive container ships, oil tankers, bulk carriers and cruise ships on the world's oceans and seas. The system measures all the vital pressures in each cylinder, detects the first sign of a fault and provides a continuous stream of real-time data on crucial engine parameters - thereby enabling engineers to optimize engine performance and switch from time- or interval-based maintenance to cost-effective, condition-based maintenance

Hybrid switchgear

The Plug and Switch System (PASS) M00 is a truly revolutionary type high-voltage switchgear that combines all the functions of a complete air insulated switchgear (AIS) bay in a single ready to install module. In a conventional AIS bay, the circuit breaker, current transformer, disconnectors and earthing switch are separate components taking up space and requiring its own concrete foundations, connections and wiring.

The PASS M00 combines these functions in a single pre-assembled, pre-tested module that has a footprint of only 700mm by 700 mm and installation time of less than half a day.



Building Solutions Brochures

Annual Report

Instrumentation Posters



Relay Brochures

Recent Media Coverage



The last word

With your continued support and encouragement our CONTACT reach is increasing. Many of you have appreciated the depth of the 'theme' approach as well as the breadth of stories and technical content. We want to hear from more of you, so please take time to fill the feedback forms. Your guidance as the ultimate consumers, will certainly help us in maximising the content value and visual appeal and further strengthening our bonds with you.



Harmeet S Bawa, Head, GF-Corporate Communications, ABB India

www.abb.co.in/contact

Who can offer more than just Power Plant Automation?



ABB – The Integration Experts



ABB offers complete instrumentation, control and electrical systems for every type of power plant. The extensive range of power plant controls includes – turbine controls (Speed & Load controls, Automatic Run Up, Rotor Stress, Condition Monitoring Turbovisory), Boiler controls (including FSSS, Flame scanners, Auto Controls), Plant and Auxiliaries control, Plant Optimization (Optimax), Static Excitation, Generator protection etc.

Our engineers know how to automate and optimize power plants and know the processes that are important for your plant's daily operations. Integration of ABB's Innovative products into economical and reliable solutions is what ABB's experts do, while supporting them over the entire lifetime of your plant.

Power and productivity
for a better world™

