

CONTACT

Issue 3 / 2006
The ABB India Magazine



ABB

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Dear friends,

As we integrate with the world economy, Indian industry is transcending geographical borders and realizing that 'factor advantages' are only a part of the story. Real and sustainable advantage comes from 'competitiveness' in the form of a complete value proposition which includes factors like price, quality, productivity, efficiency, aesthetics, delivery systems etc.

Automation technologies help to ensure an optimum balance between labour and technology, enabling streamlining of manufacturing processes, as well as greater control & integration of systems across the value chain for higher efficiency & productivity. Automation is also playing a key role in helping businesses improve return on assets and facilitating real-time information and speed of decision making.

The level of automation technologies deployed in India is still low and in order to catch up with the rest of the world, the industry must adopt best-in-class automation technologies. Automation solution providers are combining their domain expertise and engineering know-how to achieve seamless and real-time integration of manufacturing and business processes.

Globally, the paper industry produces over 300 MT of paper p.a, with North America and the Scandinavian countries accounting for around 55 per cent of the output and Asia accounting for around one-fourth. The Indian paper industry, ranks 15th with an installed capacity of around 7 MT and around 550 paper mills across the country, and providing employment to around 1.5 million people.

Demand, during the next decade, is expected to grow to about 15 MT across all major categories of paper and paper products. Moreover, consumers are becoming more and more discerning. It is time for the Indian pulp & paper industry to claim its rightful place in this growing economy and even look beyond borders. This sector is one of the best examples of the crucial role automation technologies play at the Primary, Plant and Enterprise levels, to enhance efficiency, increase productivity, streamline processes, ensure control and optimize paper quality.

This issue of CONTACT focuses on key aspects, challenges and solutions for the Pulp & Paper industry and also brings you the range and unique value proposition ABB offers to this fast growing sector.

Yours sincerely,

Ravi Uppal



HVDC undersea power link

ABB recently won an order from Terna SpA, a leading energy company that operates the Italian transmission system to deliver a High Voltage Direct Current (HVDC) power system connecting the grids of Sardinia and peninsular Italy. The 1,000 MW HVDC undersea link will carry surplus power between the Italian mainland at Latina and the island of Sardinia. Italy is one of the world's biggest importers of electrical power and the connection will deliver electricity to one million homes.

ABB will design and deliver two converter stations, one in Fiume Santo, Sardinia, and the other in Latina, on the Italian mainland - both in existing 400 kilovolt (kV) substations. The stations at a distance of 420 km apart will include converter transformers as well as air-insulated and gas-insulated switchgear. Power cables will be laid beneath the Tyrrhenian Sea at depths of up to 1,600 meters. In



addition to handling the power exchange, this sophisticated HVDC system can stabilize voltages and frequencies on Sardinia.

ABB remains the world leader in HVDC transmission technology, with 55 HVDC projects improving the transmission capacity of utilities around the world by more than 45,000 MW.

PASS on the race track

Ferrari the world famous automaker has selected ABB's PASS M0 hybrid switchgear for the high-voltage substation that feeds the legendary Maranello complex of assembly lines, offices, museum and race track with power. It was the innovative design, simplicity and proven reliability of this pioneering technology (more than 1500 units have been sold to customers in 35 countries since 2000) that appealed to Ferrari.

ABB's Plug and Switch System (PASS) M0 switchgear has revolutionized substation



design. It combines all the functions of a complete Air Insulated Switchgear (AIS)

bay in a single ready-to-install module that requires 60 percent less space than the conventional AIS alternative and takes just a few hours to install.

The Ferrari-owned substation was scheduled for modernization to secure reliability and meet the growing need for electricity at the complex. As with all substation upgrades, compact design and reliability of switchgears were fundamental requirements and ABB technologies the preferred option.

Making headlines



An ABB automation solution for 17 printing plants will enable the U.S. edition of The Wall Street Journal to appear in a new, slimmer format that will save publishers - Dow Jones, an estimated \$ 18 million in annual production costs and secure print quality. The solution is currently being

installed and commissioned at all the 17 Dow Jones printing plants in the United States in preparation for the launch of the new-look Wall Street Journal in January 2007. The ABB solution consists of 58 MPS Control Consoles for the 19 printing presses and an MPS Production press management system for each of the 17 printing plants.

MPS Production is a press automation and management system that handles the planning and production of the print product, optimizing print quality and reducing waste. The MPS Control Consoles enable operators to control and operate the entire printing process from a single workstation. ABB has supplied similar solutions for customers in Europe, North and South America, and Asia and is the



recognized leader in control and automation technologies for the newspaper printing industry worldwide.

Strengthening bonds with Dow Chemicals



ABB, recently signed an agreement with The Dow Chemical Company as one of two preferred suppliers for IEC switchgear and motor controls. The three-year pact, covering a variety of electrical switchgear and control products, complements an existing strategic agreement with Dow for ABB Industrial IT control systems. ABB is now the designated strategic supplier of

low-voltage switchgear and motor control centers, plus medium-voltage switchgear to Dow facilities that operate according to International Electrotechnical Commission (IEC) regulatory standards. The products agreement continues a long collaboration between ABB and Dow, which operates more than 150 manufacturing sites worldwide.

Let the games begin!

Arizona Cardinals' new state-of-the-art retractable stadium roof employs ABB Drives to open and close the giant panels. Retractable roofs have become a popular feature at professional sports venues as they become bigger and more complex in design and scale. Architects and engineers are looking for bold new ideas. Only a select number of companies have the knowledge and expertise to mechanize and control these immense structures, which, themselves, become architectural feats. Uni-Systems, based in Minneapolis,

Minnesota, partnered with ABB and selected the ABB ACS800 drive to provide optimum control of the roof's torque-distribution system.

An important factor in choosing the ABB drives was the inherent risk associated with running a roof on a sloped track. ABB's Variable Frequency Drive (VFD) allows for tests to drive torque before each roof motion, to ensure that each drive was operational and capable of a 100-percent torque output. Before each motion, the Programmable Logic Controller (PLC)



checks the torque output from the VFDs at 0 Hz, before committing to opening the motor brakes.

Productivity in mining

ABB has recently won a contract from the mining and minerals group LKAB to raise productivity at an iron-ore mine in Kiruna, Sweden. ABB will supply hoists, used to haul ore to the surface, as well as hoist-control systems and drives to help increase production at Kiruna by 25 percent. ABB's technologies will help support extending the depth of the

mine by about a third to 1,365 meters below the surface.

ABB will supply ACS6000SD variable speed drives, 5600 kW synchronous machines and AC800M control systems to four existing underground hoists. In addition, ABB will provide a new turnkey mine hoist with complete mechanics and brake system at surface level.



Developing the energy sector



ABB is working with Algerian oil and gas company Sonatrach to expand existing compressor and power systems in the Hassi R'Mel fields. Under the project, three existing compressor stations serving the Hassi R'Mel natural gas fields will be expanded. ABB's scope of supply includes engineering, procurement, construction and commissioning of the new stations, including new turbo compressors, upgrades to existing

compressors, and gas coolers. ABB will also provide new low-voltage and medium-voltage power distribution systems and enhancements to existing automation systems.

The improvements in the Hassi R'Mel fields will support an expected increase in natural gas exports to Europe of some 30 billion cubic meters per year within the next five years.

Real time monitoring and control with SCADA



Mumbai

ABB has designed, engineered and implemented a state-of-the-art SCADA/DMS system at Reliance Energy (REL) for the Mumbai Transmission & Distribution (T&D) network. The commissioning of this advanced system now enables REL to serve its 2.5 million consumers in a service area of 384 sq. kms. with enhanced reliability and efficiency.

The SCADA/DMS is a single, integrated system for generation, transmission and distribution networks with centralized control and monitoring and provides visibility for the company's entire T&D network. The system helps REL maintain supply under normal conditions besides providing for speedy restoration of power in case of outages.

The system also includes a complete set of Distribution Management applications including quick islanding and load shedding based on real time data that operates during contingencies, helping prevent blackouts. The system monitors and controls about 60 main transmission & distribution substations spread across the suburbs of Mumbai as well as the substation at the Dahanu Thermal Power Station located 110kms from Mumbai.

Delhi

In another significant project win, ABB has designed, engineered and implemented another state-of-the-art SCADA/DMS system at BSES Discoms in Delhi. The system remotely monitors the health of BSES Rajdhani & BSES Yamuna distribution networks in real time covering all of the 117 Grid Stations. BSES is also expanding the reach of the system to cover its network of 11kV transformers and feeders.

With this system, BSES aims to reduce the fault restoration time by over 60 percent - from a current average of 110 minutes to less than 45 minutes! BSES has also launched a unique program - called "SCADA Darshan" - for RWAs and students in Delhi. The hour-long program is aimed at making

Benefits
<ul style="list-style-type: none"> ■ Faster response time, fault isolation and supply restoration. ■ Operational flexibility ■ Helps in better planning and improved management of the electrical network ■ Reduction in losses and trouble call management ■ Enables better service to the end customer

consumers aware of the company's recent initiatives and to allow them to experience and appreciate the scale of SCADA.

Certification for Corporate Research Center in Bangalore

ABB's Corporate Research Center in Bangalore, India (INCR) has qualified for the Capability Maturity Model Integration (CMMI®) level 2 and obtaining the ISO 9001:2000 certification. INCR is the first Research Center in ABB's global R&D network to achieve this honour - a testimony to the quality, dedication and commitment of the Bangalore unit.

The certification follows a recent TUV assessment based on an integrated approach combining the Standard CMMI® Appraisal Method for Process Improvement (SCAMPISM) – Class A methodology and the requirements of ISO 9001:2000, concurrently. The TUV Rheinland team audited INCR through a rigorous 70 day long appraisal process. The appraisal team included 4 auditors from TUV and 8 trained assessors from INCR.

The deployment of an integrated Quality Management System (QMS) was a key element in the certification. QMS facilitates seamless integration of processes deployed across the organization towards providing research services, software



engineering and software application solutions in the areas of Power Products, Power Systems, Automation Products and Process Automation.

ABB offers expertise in Power Systems Consulting



Proper planning and decision making are critical for durability and efficiency. It is therefore important for utilities to have the tools to systematically analyze cost/performance trade-offs within the financial constraints imposed on them. Similarly, changes are often required with reference to standards, guidelines and procedures. Interpreting such changes and developing new optimization methods and state-of-the-art software to assist utilities in meeting these challenges is where ABB has vast experience.

Power systems consulting services enables customers to plan, operate and maintain their systems in a more economical and reliable way.

The ABB Consulting group is a global team of more than one hundred power systems experts with local presence in the USA, UK, Germany, Spain, Sweden, Italy, India and China. ABB consultants are backed up by over 6000 product, systems and service specialists in locations close to our customers, enabling the company to identify and implement total system solutions. Backing ABB's consulting business is domain expertise and field experience accumulated over decades in the power industry as well as the global presence that brings best practices from all over the world to help utility

ABB's Power Systems Consulting offering includes:

- Planning for grid upgrades
- System performance issues related to voltage, thermal and dynamic stability constraints
- Evaluating and enhancing grid reliability
- Forecasting demand growth for distribution companies
- Benchmarking utilities relative to global 'best in class' peer groups
- Asset evaluation and reliability centered maintenance planning
- Technical due-diligence in support of mergers and acquisitions

customers improve their business performance.

World-class learning hub for power technologies

ABB's Training Center at Vadodara has been developed as a hub of learning for Power Technologies. The world-class facility, offers specialized training on power technology products, systems and solutions to ABB's customers, employees, students from technical institutes and vendors. ABB has similar centers in Bangalore, Mumbai and Nashik as well. These training centers were developed to help customers stay ahead by providing hands-on experience and in-depth classroom instruction for sharpening existing skills and integrating advances in technological innovation.

The demo room is equipped with a wide range of live products including a SCADA system (integrated with the outdoor switchyard), protection relays, OLTC, Ring Main Unit and control panel. The outdoor switchyard has operating models of high voltage and medium voltage circuit breakers, disconnectors, capacitor bank, transformer bushings, power and distribution transformers among others.

Each training programme is tailor-made to fulfill the specific requirements of customers. The training center has hosted several important customers from India and abroad. Some of the recent patrons of the training center include PGCIL, NHPC, ONGC, NTPC, Ambuja Cements, Indian Railways, GAIL, L&T, DMRC and several State Electricity Boards. Investment beneficiaries include customers and ABB Group company representatives from Bhutan, Syria, Oman, Taiwan, Bangladesh, Vietnam, Indonesia, Australia, South Africa and Morocco among others.



Facilities include:

- Sophisticated learning aids like multi-media presentations, simulations and product cut-outs
- Demo room with operating models of a wide range of products
- Practice benches for hand-on training
- Well-equipped classrooms with e-learning facility
- Outdoor switchyard with operating models of HV and MV product

Scope of training modules include:

- Operation and maintenance
- Condition-monitoring
- Erection and commissioning
- Protection and distribution automation
- System engineering
- Settings and general protection schemes

CM flags off turnkey substation project in Karnataka

The Chief Minister of Karnataka state, HD Kumaraswamy and the State Power Minister HD Revanna recently performed a 'Bhoomi Pooja' (a symbolic ceremony to bless the ground and bring good luck) along with several state dignitaries and KPTCL officials, to mark the commencement of a greenfield 220 kV sub-station project at Holenarsipura Taluk, located west of Bangalore and appx. 20 km from Hassan. The project is being executed on a turnkey basis by ABB for the state's leading transmission utility, Karnataka Power Transmission Corporation Ltd (KPTCL).

Speaking on the occasion, the Chief Minister said, "The substation is extremely



important to this region and once complete, Holenarsipura and the surrounding areas will be greatly benefitted with improved availability and quality of power.

This significant project has been entrusted to ABB and we expect completion in around nine months. I am sure ABB and KPTCL will work together to ensure timely commissioning."

The project encompasses a 2 X 100 MVA, 220/66/11kV sub-station and construction of a 220 kV Loop-In Loop-Out (LILo) line from the Shimoga-Mysore 220 kV Line to the proposed 220 kV S/S at Kadavinakote (Holenarsipura Taluk). The proposed sub-station and transmission lines will cater

to the load of areas in and around Holenarsipura taluk which is currently fed from the 220/66kV sub-station at Hassan through 66kV transmission lines. The setting up of the station at Kadavinakote and construction of the transmission line will help increase the quality of power by increasing the voltage profiles and reducing losses.

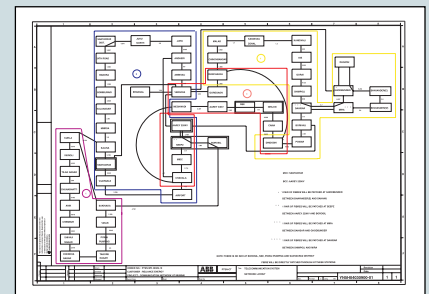
ABB has an enviable track record backed by expertise and experience to deliver such projects to the highest standards and on time. ABB will work closely with KPTCL and the Govt of Karnataka to ensure that the region benefits from reliable power supply.

Fibre-optic communication network for Reliance Energy

ABB has successfully engineered and commissioned a fibre-optic communication network for Reliance Energy Limited (REL) providing it with a converged and reliable solution for Voice, SCADA and IT applications. The communication network encompasses 52 locations including the Generating Station at Dahanu (1000MW), 220kV Transmission Substations and 33kV Receiving Stations.

Previously, SCADA & IT Traffic was handled through separate networks.

With ABB's solution, REL now has an integrated network for SCADA & IT applications that substantially reduces infrastructure and management costs in a challenging power transmission and distribution environment. The communication network enables remote management of receiving stations from a central location as well as improved reliability/availability of the network with ABB's state-of-the-art network management system. The solution is based on a ring topology with a Master Control



Center (MCC) at Santacruz and a Back-up Control Center (BCC) at Aarey 220 KV substation.

Integrated Building system solutions

Real estate projects

ABB India is supplying an Electrical and Energy Management System for the Boulder Hills Township in Manikonda near Hyderabad. The super luxury township spread over 550 acres is being built by Dubai based Emaar Properties in partnership with Andhra Pradesh Industrial Infrastructure Corporation Ltd. The township



includes 460 villas, 15 commercial complexes, 12 residential apartments and an 18-hole international standard golf course. ABB's scope of supply includes 33 KV switchyard extensions, 11 KV Distribution Panels, Fifty Six 11 KVA Compact Sub-Station, 420 kms of cable, street lighting and Energy Management System.

ABB will also provide turnkey electrical solutions for the Hill County Residential Township in Bachupalli, Hyderabad. The township is spread over an area of 500 acres and is being built by Maytas Infra Private Limited. The township will house villas, residential complexes and recreation facilities. ABB's scope of supply includes 33 KV switch yard, 33 KV RMU, 33/11 KV transformers, 11KV/433 transformers, HT / LT cabling, street lighting and earthing work.

Ensuring critical uptime

ABB India has recently won an order for providing power to IBM - Bharati Televentures' Datacenter in Noida. The 3 tier Central Primary Data Center is designed for 99.98% uptime and is built to consolidate and facilitate archiving and retrieval of data from different Data Centers across the country.

The project scope includes distribution of UPS power to the servers through a large network of bus trunking systems and equipment like Automatic Transfer Switches, Power Distribution Units, Earthing Systems & Lighting.



Quality Certification



ABB Building Systems including complete HVAC, electrical contracting, Integrated Building Management Systems and After Sales Services has been Certified for ISO 9001:2000. Quality Management System as well as EN ISO 9001:2000 by RWTUV Systems GmbH. The certification is a validation of ABB's commitment to the highest quality standards.

HVAC and BMS for industries

ABB recently won a contract for revamping the HVAC system at ONGC in Bombay High, which is India's largest offshore oil field situated approximately 161 kms north off the Mumbai coast. The project also includes instrumentation and architecture for 4 clusters of platforms. The scope of the order includes design, engineering, supply, installation, testing, commissioning, hook up, post commissioning services and on the job training for ONGC personnel.

In another recent success ABB has been entrusted by Reliance Life Sciences Pvt. Ltd. to supply and deliver HVAC and Building Management System (BMS) on a turnkey basis for its upcoming facility, at their biotech park in Mumbai. The scope of work encompasses design and engineering, equipment supply, erection, testing, commissioning and validation of



HVAC and BMS. ABB solution will help preserve the required clean room needs apart from the right pressure, humidity and temperature requirements.

The paper chase!

ITC - Paperboards and Specialty Papers Division (ITC - PSPD) or ITC Bhadrachalam as it is popularly known, is among the leading names in the paper industry. Employing the most contemporary technologies, ITC - PSPD has risen to become one of South Asia's largest manufacturer of Packaging and Graphics Boards. We met up with Mr Pradeep Dhobale, CEO of the division to gain some insights into the Indian Pulp & Paper industry and learn more about the recipe behind ITC's success in a competitive and highly quality conscious market. Mr Dhobale played a vital role in the planning and commissioning of ITC's US \$ 150 million expansion project. Under his exemplary leadership, ITC Bhadrachalam Paperboards has emerged as the largest single location paper mill in the country and has achieved a dramatic turnaround, in terms of returning to profitability.



Pradeep Dhobale CEO - ITC PSPD

Chemical Engineer (IIT - Mumbai), Professional training in paper making technology at mills in France and Sweden, General Management training at Management Development Center, Chelwood of British American Tobacco Co. UK

Mr Dhobale began his career as a management trainee with ITC Bhadrachalam Paperboards Ltd in 1977, quickly moving up the ranks to become the Managing Director in 1999.

Following the amalgamation of ITC Bhadrachalam Paperboards Ltd with ITC Ltd in March 2002, he took charge of the Paperboards & Specialty Papers Division as CEO

Industry thought leader

Vice President - Apex Council of Indian Paper Manufacturer's Association

Vice Chairman - CII - A.P. State Council

Past President - Indian Pulp & Paper Association

Can you give us an industry perspective on how the Paper & Pulp sector is emerging in India?

The demand for paper products has traditionally been growing in line with GDP. Till last year, this was around 7 per cent and now we are talking about 8 - 10 per cent levels, so we expect the sector to see a healthy growth rate going forward.

I hasten to add that the extent to which we can tap this opportunity depends a lot on whether the pulp & paper industry makes the right investments at the right time and proactively addresses cost and quality issues.

To put things in perspective, India is where China was nearly 20 years back, which would mean a per capita consumption of paper of about 6.8 Kg/person/year. Today China has crossed 50 Kg per capita and even the world average is at about 45. In fact, developed countries like USA and Germany are as high as 300 Kg per Capita. Even if we want to reach the China level in the next two decades, paper consumption in India has to grow nearly 10 times from the present base.

India's present capacity stands at about 7 million tons and is projected to reach 15 million tons in the next 10 years. The Indian paper & pulp industry recognizes the growth potential and most established paper players in the country are in capacity expansion and augmentation mode. In many cases, the scale of investment is fairly high in the region of Rs 500 crore and above.

What are ITC's capacity expansion plans?

ITC has a combined capacity of around 400,000 tonnes per annum. The

Bhadrachalam mill (capacity 300,000 TPA) is the largest single location mill in the country. Currently we are looking at a brownfield expansion of around 120,000 tonnes at Bhadrachalam. This would require about 500,000 tonnes of wood which translates to around 25,000 hectares of land to sustain this production. Since we have the finances to invest, our expansion plans depend mainly on how much raw material we can get on-stream and how fast.

Unit Bhadrachalam

- Production capacity of 300,000 TPA of virgin and recycled boards.
- Commissioned India's first Elemental Chlorine Free Fibreline, with a capacity of 100,000 TPA.
- ISO 9001 and ISO 14001 accredited
- OHSAS 18001 certified

How do you address some key environmental & social issues?

We at ITC take our environmental responsibility very seriously and even go beyond the basic requirements of the Pollution Control Board. The Bhadrachalam mill was the first in the country to be an ECF (Elemental Chlorine Free) mill. Chlorine as a bleaching agent is cheap and has been traditionally used in the industry. When chlorine reacts with Cellulose fibre, it creates a polluting compound which can be cancerous when exposure is high and continuous. The use of Chlorine is still not banned in India and the Government has allowed upto 2008 to implement ECF technology. ITC introduced this in 2002 and all our expansion plans are based on this technology.



Similar to cloning technology and ECF, we are also the first paper company to develop technology for fly ash bricks. All paper industries use a lot of coal, and we generate almost 250 tonnes of ash per day. Power plants also use a lot of coal and dump the ash slurry in lagoons which can lead to contamination of ground water. This is no longer considered as an environment friendly activity. The Government has only 'recommended' that lagooning should be stopped.

At ITC, with an investment of Rs 20 lakh we built a plant that used the ash to convert into fly ash bricks. For our mill, we needed four plants and we encouraged the local entrepreneurs to set up these plants. Our own factory and colonies are built with fly ash bricks and this helped prove to the community that these bricks are strong. We then worked with the District Collector to convince him about environment friendliness of fly ash bricks. Thereafter, the authorities have been recommending that all government funded buildings in the area should be built only with these bricks.

Unit Tribeni

- Production capacity - 33,000 TPA
- 50 year tradition of specialty paper making
- ISO 9001 and ISO 14001 accredited
- OHSAS 18001 certified

Today, no company in this industry can survive without paying due regard to environmental issues. We, on our part are proud to have made a positive impact to the environment and the community. I would also like to pass on a large part of this credit to our discerning customers, who often insist on products that are environmental friendly and are made using environmental friendly techniques.

How has automation made a difference to your operations?

We were among the first mills in the country to use automation technologies extensively to build and maintain our leading edge in the industry. Our Bhadrachalam mill is arguably the most automated mill in the country today. We started the factory in the 1980s with single loop controls and then took several automation steps in phases. In the 90's we implemented Distributed Control Systems (DCS). 2 years back we invested in Manufacturing Execution Systems (MES). We are now on the verge of going in for a fully integrated ERP system. Automation also helps us to optimize costs and improve quality. Our 'paper' is practically, untouched by hand!

Automation is also playing a critical role in our material handling functions. For example till the late 90s our production was at 85,000 tonnes with 1400 employees. This year our production stood at 300,000 tonnes with around the same number of employees! In one word - 'productivity' and largely driven by automation.

Unit Kovai

- 65000 TPA of recycled boards
- Increased flexibility & lower lead time
- ISO 9001 & 14001 accredited
- OHSAS 18001 certified

An Automatic Storage and Retrieval System (ASRS) is used at our warehouse. The warehouse stores about 3500 tonnes of paper and has a movement of 600 tonnes a day. A typical warehouse like this would require around 200 people - we have one! The entire warehouse is managed with robotic cranes and palletizing.

But I hasten to add, that automation does not take away jobs - it only frees vital human resources for more gainful engagement. People will continue to play an important role in our's and any business. What automation allows us to do is to add fewer numbers during our growth phase and enables productivity and scalability. Higher output in the factory requires more raw material and more jobs get created in plantations.

From a market competitiveness perspective, as customs duty comes



down, India will be a huge market not only for domestic paper mills but for international players as well. This will mean added pressure to keep costs in check and automation will play a major role in helping paper mills to optimize costs, ensure quality and increase efficiency.

What's your experience of working with ABB?

ABB has played a crucial role in automating the plant and implementing our stringent Quality Control System (QCS). Our ULMA Web Inspection system can spot defects upto 0.2 mm diameter and record the coordinates. This was a major investment for us and probably the first of its kind in India. We reposed our confidence in ABB's technology, domain expertise and global experience. Our automation systems have helped to create value in the factory and bring us a higher Return on Investment (ROI) through cost optimization, quality control and productivity.

ABB has high-end technology, with a wide range of products and solutions for the pulp & paper sector. Since advanced automation is still new to India, we would like to see greater collaboration between users and providers, especially in terms of optimizing the equipment to maximum advantage. We would also like to see a greater emphasis on service needs to on-site support. In fact, we are looking forward to a regular engagement with the technology providers for maintaining some of our capital equipment. ABB certainly has the domain expertise and are recognized power and automation technology specialists.

The world of paper

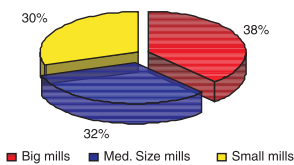
The Pulp and Paper Industry is an integral part of India's recent industrial resurgence and one of the 35 identified high priority sectors. India is currently ranked fifteenth among global paper producers and is quickly moving forward. According to the Indian Paper Manufacturer's Association, the Pulp & Paper sector provides employment to over 0.3 million people directly and 1.0 million people indirectly. The growth in this sector is expected to be driven by several factors including GDP growth, population growth, increase in literacy levels, growth of services sector and government policies on foreign investments. The prospects are bright and by 2020, several analysts predict production to reach levels of 15 million tons with writing and printing paper experiencing the highest growth.

Market Synopsis

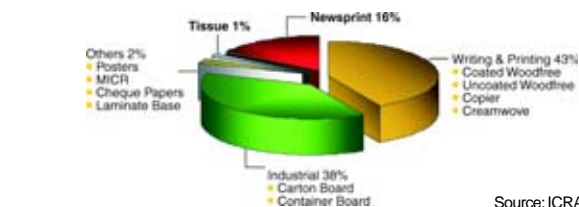
Market Overview

Production	5.8 MT
No. of Paper Mills in India	Over 600
No. of Mills > Capacity 50000 T/A	< 25
Share of large mills	>40%
Per capita consumption	5.5 kg
Consumption	5.2 MT

Volume sharing by type of mills



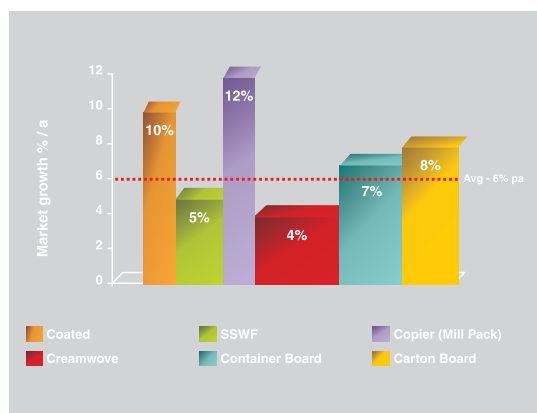
Market Size(04-05) : 5.7 Mn TPA CAGR : 6%



Source: ICRA

Market Synopsis

Demand & Growth Segment wise



India's demand to grow @ 6% CAGR as against 2.8% globally

Source: ICRA

Market Synopsis

Snap Shot – Paper sector

(*000 tonnes)

	2001	2002	2003	2004	2005	%CAGR	2009(E)
Capacity (*000 TPA)	6676	6909	7040	7290	7540	3.3	8750
Effective Capacity	5809	6034	6160	6390	6640	3.6	8000
Production	4673	4831	5202	5530	5856	7.2	7200
Effective Capacity Utilization%	80.4	80.1	84.4	86.5	88.2	3.4	90
Demand	4614	4854	5152	5452	5776	5.7	7140
Imports	134	173	200	250	190	(2.5)	400
Exports	193	150	150	170	270	12.8	250

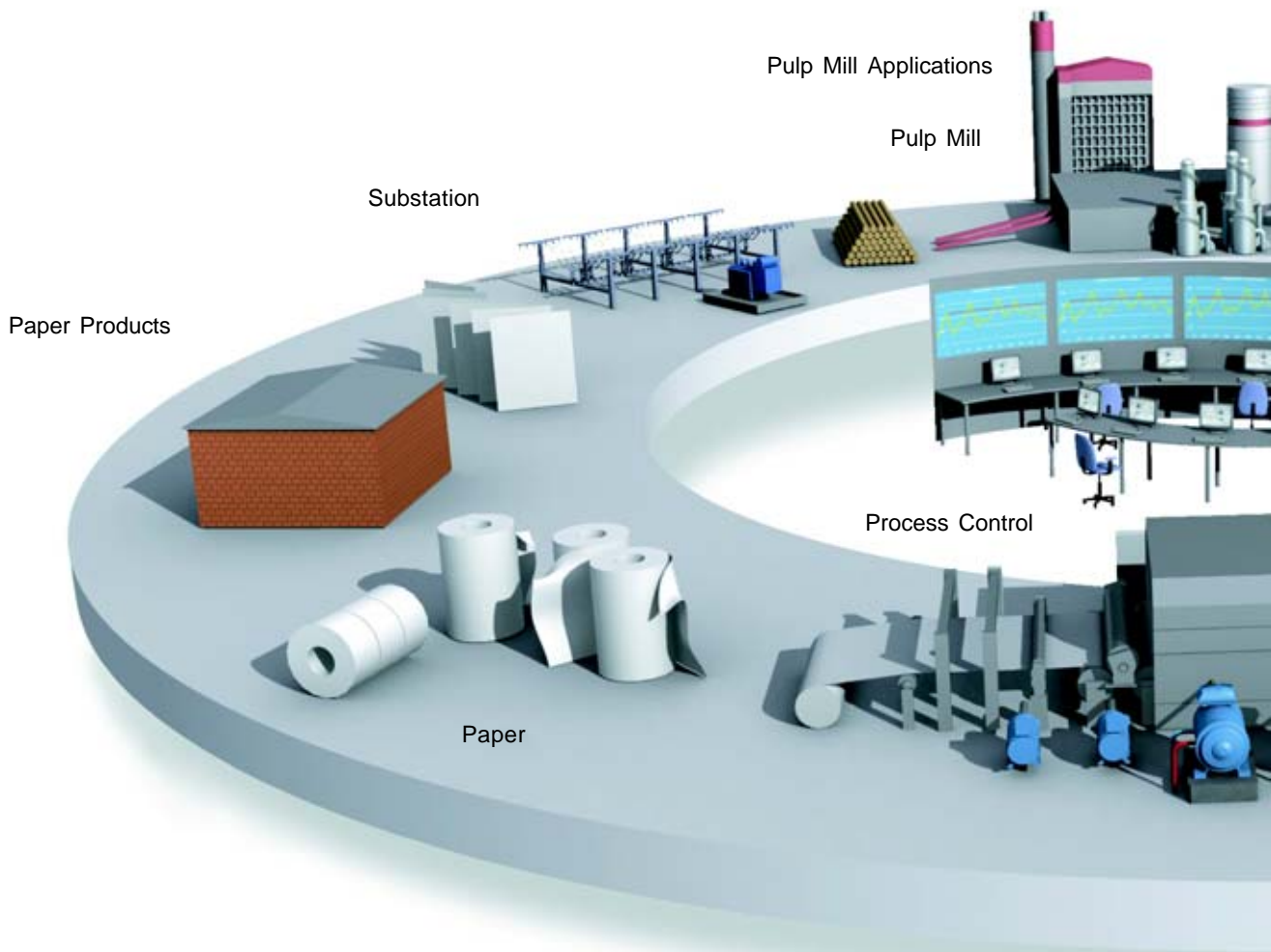
Source: Bank of Baroda Risk Management research reports

ABB'S integrated solutions

ABB provides comprehensive integrated solutions to meet every requirement of the pulp and paper industry - from setting up entire plants to specific needs related to the pulp & paper manufacturing process.

ABB's products, solutions and services covers the entire value chain in the pulp & paper mill from field instrumentation, electrical and drive systems to Automation Open Control System (OCS) and Management Information Systems.

ABB provides a full range of complete lifecycle services for all systems and products from spare parts and equipment repair, remote services and training, maintenance, and evolution support to complete asset management.



CPM Solutions

- Production Planning and Optimization
- Production Tracking
- Quality Management
- Customer Service Management
- Energy Management and Optimization

Electrification

- Power Distribution
- Process Electrification
- Building Electrification

Open Control System

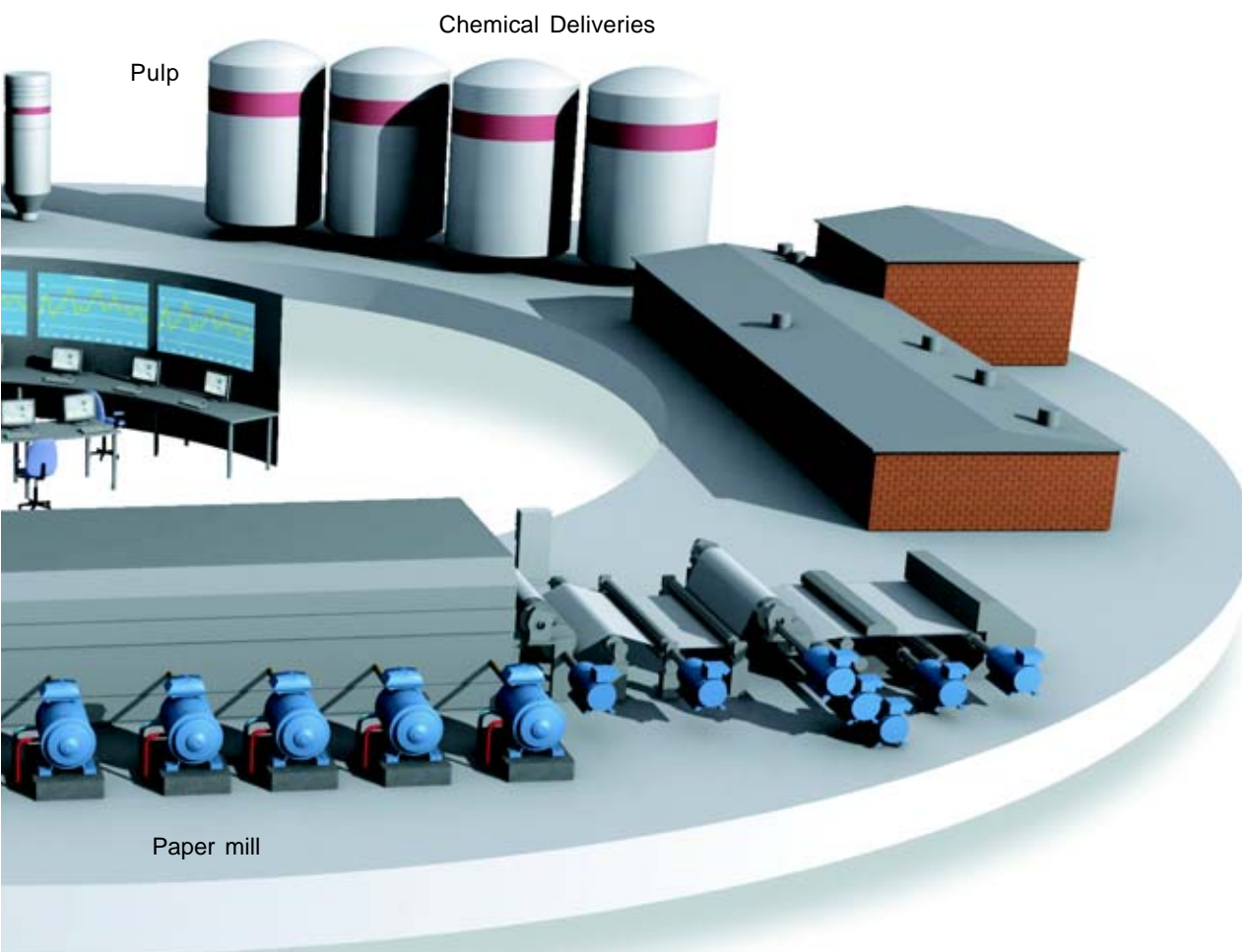
- Industrial IT Extended System 800xA
- Advanced Process Control
- On-line Optimizer
- Process and Control Optimization
- Process Information Management

Solutions for pulp & paper

While others are only beginning the effort to bring fundamentally different systems together in a common user interface, ABB has been using a common platform for both control and user interface for all its new products since the introduction of Industrial IT in 2001.

ABB's pulp and paper customers can now realize the advantages of a system based on an architecture that ties together all major automation systems commonly found in a pulp and paper operation.

ABB provides paper mills with the tools, technologies and know how, helping mills to help them perform safer, smarter and better with substantial cost savings.



Chemical Deliveries

Pulp

Paper mill

Drive Systems

- AC Drives
- DC Drives
- Direct Drives

Quality Control

- Scanners
- Controls
- Measurements
- Profilers

Services

- Engineering
- Installation
- Commissioning
- Start-up
- Training
- After Sales Services

Web Inspection

- Web Imaging
- Automatic Braking System

Monitoring production with drives

ABB is supplying drive technology to the M-real Biberist mill in Switzerland. M-real will rebuild its coating machine for increased production and machine efficiency. ABB's drive system, including 49 drive sections, will run and monitor the entire coating machine production line. The drive system includes application software, 70 motors and new generation MultiDrive ACS800 industrial drives. The reel width of the coating machine is 5.1 m and design speed increases from 1200 to 1400 m/min. ABB's drive technology will increase production capacity and improve paper quality. M-real Biberist mill produces 420,000 tons of wood-free coated (graphic paper) and wood-free natural paper (office paper) annually.



Paper Productivity



The Andhra Pradesh Paper Mills Limited (APPM) is one of the largest integrated pulp and paper manufacturing mills in India. At present, APPM manufactures 1,60,000 TPA from its two units in the East Godavari District of AP. The mill comprises 5 paper machines at Unit APPM and 3 at Unit CP producing paper and boards of different MG and MF varieties in the range of 21 to 250 GSM. APPM's product range is comprehensive and covers a wide spectrum of writing and printing paper, packaging paper, specialty paper, paper boards and newsprint for both domestic and export markets.

ABB worked with APPM to help set up a 550 TPD, state-of-the-art, pulping facility at its Unit APPM. The scope of the work encompassed complete design, supply, engineering, testing and commissioning of 11 kV/6.6 kV Switchgear, Power and Distribution Transformers, Neutral Grounding Resistor Panels, LT Bus Ducts, HT/LT Cables, 415 V LT Power Control Centre and Motor Control Centers, Lighting Transformers, HT and LT Motors, 7.2kV Capacitors, 415 V Automatic Power Factor Controller Panels, Plant Illumination, Annunciation Panels, Batteries and Battery Chargers, UPS and AC Drives as well as the complete automation of the plant. ABB's automation system integrates all mill operations, connecting the main control room to the system servers as well as all the applications and process controls including Pulp Mill and Recovery Island.

This is the first-of-its-kind facility with centralized control room for pulp mill with 23 operator stations

Enhancing paper quality & efficiency

ABB is supplying Quality Control Systems (QCS), Distributed Control Systems (DCS) and Paper Machine Drives for Century Mill's new paper machine. Century Mill is one of India's leading pulp & paper producers with five paper machines (PM I-V) and a capacity of 1,60,000 tons per annum soon to be enhanced to 2,45,000 tons. Maintaining correct tension demands high accuracy and constant torque at high speeds. ABB drives help keep the finished product correctly tensioned, while the products are wound onto reels during the final stages of manufacture. ABB's solution will enable Century Mill to benefit from improved quality and reliability by fine tuning processes and making corrective production and maintenance decisions before problems occur.





ABB's innovative PASS switchgear



ABB's PASS (Plug and Switch System) hybrid Air Insulated Switchgear (AIS) and

Gas Insulated Switchgear (GIS) concept provides a fully integrated and self-contained switchgear module that has revolutionized outdoor substation design.

It combines all the functions of a complete AIS bay in a single ready-to-install module that requires 60 per cent less space than the conventional AIS and takes just a few hours to install. PASS is available in two models, the PASS M00 up to 100kV rated voltage, 2kA rated current and breaking current up to 31.5kA and the PASS M0 up to 170kV rated voltage, 2.5kA rated current and breaking current up to 40kA

Special features

- All the functions of a bay are combined in a single module
- The operating and interrupting functions are integrated within a housing in SF6
- Fully transportable and easy to install
- Guaranteed reliability
- Extremely versatile when substation layouts/planning solutions are drafted

Power plant protection with ABB's GCB

ABB showcased its latest high-end technology offering for power plant protection, the Generator Circuit Breaker (GCB) at a seminar in New Delhi. The seminar drew participation from power generating companies, EPC's and consultants.

GCBs are core components of a modern power plant, protecting both the generator and the power transformer. ABB's GCBs are widely used in all kinds of power stations namely hydro, combined cycle, pumped storage, thermal, nuclear and



gas turbine power plants. The breakers are also suited for retrofitting in existing power plants and are available for both indoor and outdoor application.

Faults at power stations can cause severe damage to critical equipments, long-term

outages and heavy economic losses. When compared with conventional methods of protection, generator circuit breakers offer faster and superior protection. Application of GCBs offers benefits like simplified plant layout and operational procedures, reduction in stress on components in normal service and better and faster fault protection thus significantly reducing extent of damages for minimized repair costs and outage time. ABB's GCBs are the only ones in the world, which can switch fault currents up to 200,000 ampères

New backward - bending 6-axis robot

ABB has recently introduced the flexible IRB 6650S-90/3.9 m - a shelf mounted, six-axis robot with an enhanced working envelope over previous models. With a reach of 3.9 metres, the IRB 6650S is capable of full vertical and horizontal stroke motion - as well as providing increased reach forward and down. With virtually no footprint, the shelf-mounted robot provides ample space to handle large parts - allowing for shorter cycle times. The IRB 6650S is an attractive alternative to a linear, 3-axis robot,

conventionally used in injection moulding applications. Based on 6-axis technology, the robot is superior in versatility, reach and precision. The IRB 6650S is an ideal solution for large injection moulding machines requiring over 1,000 tons of clamping force. The flexibility of the six-axis robot means no idle time between shoots, facilitating post-process applications like flaming, sprue cutting, tape dispensing and assembly operations. This allows plant designers to reduce the number of downstream stations and decrease plant throughput times.



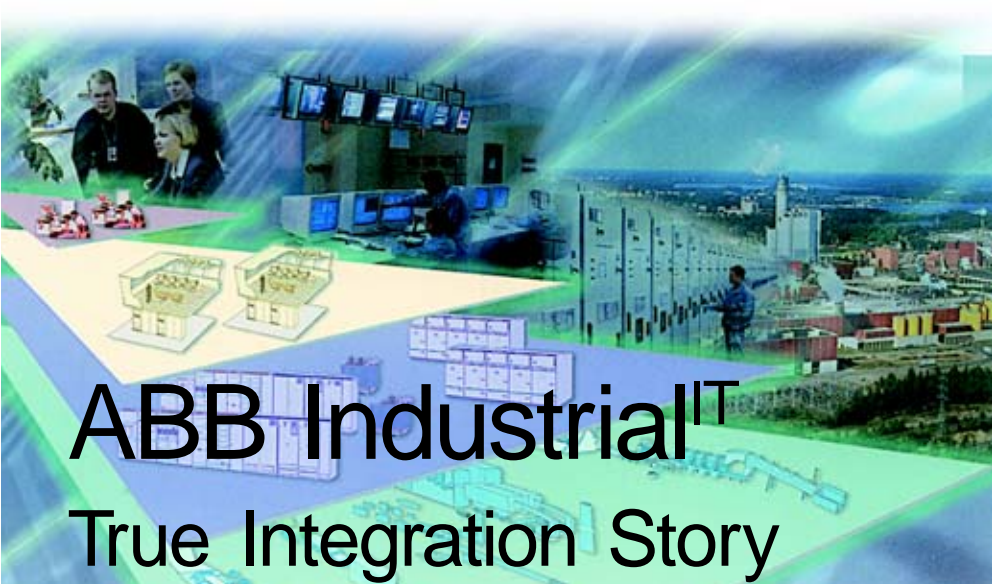


ABB Industrial^{IT} True Integration Story

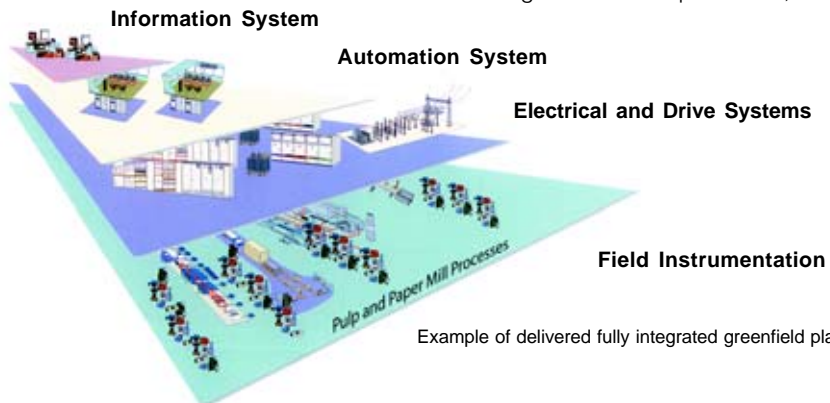
Today's trend is global integration in many different ways. Companies seek synergies, focus on core operations and find ways to cut overlapping in these activities. This trend is reflected in the different operational levels for improving efficiency, while not permitting any compromise on the flexibility and high efficiency achieved in smaller entities. Even though different mills - or system suppliers - have stronger individual competencies in some areas, e.g. in process automation, the need for in-depth expertise in all areas should not be undermined. The paper process is one operation where merging more and more functions under the same control areas has been going on for as long as solutions for process automation have been developed. The main dilemma has always been the different process tasks setting different requirements for control functions. Primary design parameters of integration include both software characteristics and the hardware capacity to execute the desired task. With an increasing number of different tasks and a perpetual need for even faster execution, the data processing demands in paper making become more difficult to meet. Device level control tasks are a major challenge for the integrated automation concept.

Integration relies on data communications. Open communication protocols are not enough.

The demand for a higher level of integration in process automation is now based largely on a general demand for on-line information for the rationalisation of operation & maintenance. Processes include tens of thousands of signal and control points, varying from millisecond transmission speeds up to several minutes, with random

transactions taking place daily or at an even slower pace.

Conventionally most of this information is available in various automation islands, which can communicate with each other by exchanging predefined data arrays. Data exchange can be accomplished in different ways. Without generic standards, different vendors have developed proprietary communications. When using open communication protocols instead of constructing proprietary communication systems, much of the one-off work, as well as vendor dependence, can be avoided. Even so, although the protocols allow freedom to communicate, most of the data exchange remains tailored for a certain purpose, delivering a vital, but relatively small amount of available data and sometimes creating bottlenecks for critical functions. Programming continues to be carried out by specialists from vendors of different automation islands. It is quite clear why generic communication protocols are not enough. Tighter integration is necessary to avoid the burden of constructing communication rules separately for different parts of the system, not to mention the additional communication hardware.



Example of delivered fully integrated greenfield plant solution.

Automation technology can be optimised for one type of functionality, but can it be for many?

In paper making, a typical form of integration in the past has been the combination of paper machine drive control and process control. From the machine control point of view, the combined drive control and machine control itself is a natural fit.

In ABB's automation concept this first combination has already been successfully implemented since the mid 80s. The Integrated MD16 control concept was based on the ABB MasterPiece/200 platform. 10-20 systems annually, making a total of 190 systems, were delivered over the period 1985-1995. During that period, almost one fifth of all ABB drive system deliveries comprised integrated systems, the rest being distributed control systems.

Pitfalls of Integration. The benefits of the integrated systems were obvious: efficiency of process management and maintenance; common operator interface and tools, fewer spares, a fast response and access to all control parameters, and above all, reduced total life cycle cost.

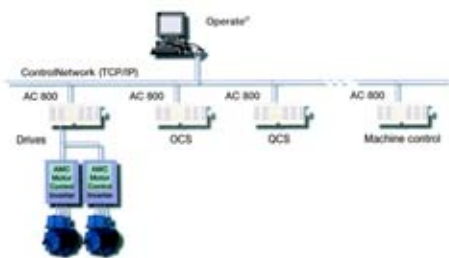
Open communication standards were yet to come, meaning that automation was based on proprietary communication. Such architecture was designed for database and I/O handling, and the fast control tasks had to be solved with assembler programs and special software. This led to solutions which were no longer user friendly.

The issue still remains. In some recent cases where drive control has been integrated with an alien process controller, specific fast drive control tasks have subsequently been reprogrammed into a third, drive specific controller just to ensure correct operation. The planned savings (reduced engineering, fast start-up, uniform tools, etc) became obsolete.

The handling of all the measured data with conventional database architectures, designed for batch processes, is not

always efficient enough to ensure fast and accurate control. The integrated solution needs to be designed with features supporting very different dynamics to those required for process control only. With special assembler software for fast control tasks, the solutions (like MD16) become apparently "clumsy" and costly for users. There was a price pay for the special capacity. The investment cost was higher, capable vendors were few and the degree of vendor dependency was apparently a customer concern, too. It was not yet time for the true integration story.

The true Industrial IT integration of the process and drives.



Benefits:

- + optimized CPU performance
- + optimized communication
- + synchronized time throughout whole system, including drives
- + advanced drive control features like patented adaptive load change compensator
- + same tools/documentation/spares
- + single point programming and diagnostic access from OperateIT
- + system scalability, same controller for all purposes permits optimal usage of controller performance
- + worldwide proven standard solutions including safety risk analysis
- + local engineering in 12 countries - totally 300 persons working for P&P Drives
- + remote support: call center or network connection

Integration of the process and drives with a dedicated drives controller.



Benefits:

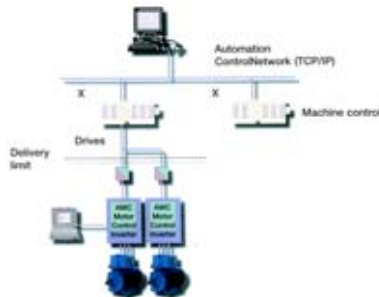
- + both vendors have proven solutions & optimized equipment. Scope of delivery well defined - minimal technical risks.

- + standard OPC interface
- + advanced drive control features like patented adaptive load change compensator
- + drive vendor gives full support up to OPC interface
- + remote support: call center or network connection
- + worldwide P&P drives network to support customer. Local engineering/ expertise.

Disadvantages:

- separate programming tools
- separate controller spares

Integration of the process and drives with multiple communication links to the process controller.



Benefits:

- + same hardware for drive and automation controller
- + same programming language

Disadvantages:

- communication via general purpose fieldbuses, limited data, e.g. control of torque selector, change of master/follower combination, clock synchronization for diagnostics purposes not possible from automation system
- protocol converters needed for each drive
- no hard real-time in Windows based automation systems
- process experts still needed for both drive control and automation (not enough with only programming knowhow)
- service needed separately for drives and automation
- drive tools not integrated into automation platform
- no worldwide support and local control expertise for drive control

Distributed systems; steps toward the future.

On the other hand, the main stream was smaller control entities. Most customers preferred to split investments to permit a wider range of vendors to compete for smaller entities and distributed controls, thus leading to lower investment costs.

Naturally there are technical drivers too, that speak for distributed drive control solutions: simplified control area, flexibility, capacity reserves for dedicated drive functions, easier standardisation (modularity), and so forth. As a result of this development, almost all ABB paper machine drive systems since 1995 have been delivered with dedicated drive controls.

The main focus in the distributed system applications has been the ability to execute fast control loops and dedicated functions for special paper making processes.

One of the most common of these is the flying splice function, where the paper web is changed from one roll to another at full speed in continuous production. Such demanding processes can exist in any kind of production machines, as well as in modern finishing machines. Sometimes, despite the simplicity of the apparent function itself, there are complicated load compensation, or other optimisation, functions which are extremely demanding for the speed of communication. Such functions are often necessary, for example, in tissue machines or in on-line calendering. Centre winding is applied in many modern concepts, and winders already operating at a web speed of above 3000 m/min require very accurate control functions to be successful.

Optimizing the machine controls.

With complete automation deliveries, where ABB automation platforms and drives have been selected as a truly integrated solution, the paper machine control logic as well has been integrated in this same platform. It offers the same I/O, the same tools, excellent data communications and CPU utilisation which is optimised for each control area. The I/O is accomplished with ABB's S800 units, machine control is installed in ABB's Advant Controller (450) stations, and the drive controls are located in ABB's Advant Controller (80) stations. The machine supplier is liable for the machine control functions presented as a logic diagram. The HW and application SW of the machine control has been included in the overall ABB System, including Electrification, Drives & Automation.

There is, however, a distinct difference in installing fast drive control functions in a conventional type of automation system. Without sufficient design features in the automation system, an inadequate response to essential drive functions can deteriorate machine runnability.

Basic functions or everything included?

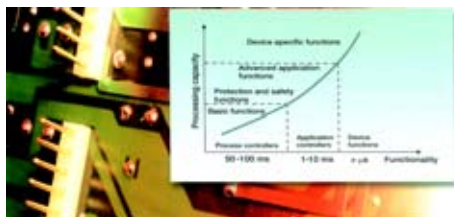
There are many justified advantages when integrating either machine or process control, or both, in the drive control. Some of these become questionable if not carefully evaluated and properly engineered. Today, when creating demanding drive

controls in a process controller, the complete requirements must be known. Since no single 'right' solution exists as with respect to system integration, the customer and system supplier must thoroughly weigh up the issues below, in order to arrive at the best possible end result for a certain application.

Common automation technology is not enough. The two main considerations are; 1) the amount of required communication hardware in the control command chain, 2) the data processing and transmission capacity of the complete communication chain.

One example of the specific needs of the control on the device level is the calculation of the motor flux vector positions 40,000 times a second, or reversed: once in 25 microseconds. Many measurements and functions have to be extremely fast. No doubt there is a need for a very specific device level controller with dedicated software for motor control. Besides, without this particular capacity, the paper machine would suffer from bad runnability, e.g. loss of speed feedback from pulse encoders or other disturbances. Running advanced machines with the required efficiency without pulse encoders, as with ABB's Direct Drive, would not be possible. The second level in the command chain is the application controller. Usually the fast application tasks, as mentioned earlier, are dealt with at this level. The fast command execution requires the rapid collection of a vast array of measured data. For instance, obtaining web break and splicing reports will need a specific execution capacity from the hardware and software or master/follower functions requiring a millisecond level communication speed. Sometimes it is also necessary to install the speed control for an inverter in the application controller. This will place an additional load on the controller.

Again, such functions as advanced tension control (in fast load change situations) would not be possible without the dedicated capacity in the application controller.



Increase of functionality compared to processing capacity requirements.



Documentation seamlessly integrated into the diagnostics system.

When all requirements are carefully studied, the dedicated drive system controller is often found to be the most practical solution, especially when seamless compatibility with the other components of the process automation can be ensured.

Open protocol data links create overshoot of redundancy. As explained above, drive converters inevitably include sophisticated internal command structures and data processing software. Dedicated controllers usually communicate by means of the internal link and with the same comm & structures. To communicate with inverters by open communication protocols, each drive unit requires a separate device, a general purpose protocol converter, to be able to transmit data to an alien controller. This can constitute a significant hardware cost in paper machines with a large number of drives, e.g. in coating machines where unit power and cost per unit is low. The extra cost is caused by those protocols that are in fact created for merely modest communication needs for simple field devices, such as valves, and so on.

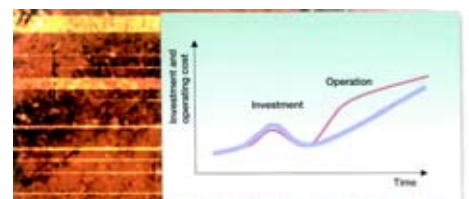
Additionally significant hardware redundancy on the lower device level occurs, in contrast to the redundancy eliminated on the higher automation level, between the dedicated controller and the process automation. By using ABB DriveIT and ControllIT products, the above linkage duplication can be avoided.

Diagnostics with a limp. Due to the use of the internal communication links, the application controller has all-inclusive access to any measured data in the drive converters. Some fast functions need fast and thorough status information, but recording converter dataloggers with high sampling rates - either for on-line drive diagnostic needs or for offline trouble shooting tools - must also be performed extensively, in order to quickly analyse the root causes of web breaks, trippings, and so forth. If such data snapshots are not available, trouble shooting will require additional measurements and several repetitions of the problem.

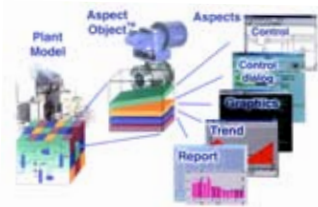
The wider the integration is, the greater the probability that a available data is disregarded due to lack of in-depth focus. In the worst case only the most essential operations are ensured, and diagnostics functions do not meet the new flexibility requirements in today's paper production, resulting in deteriorated availability. Again, the net data transfer capacity must be adequate. The specified baud rate does not indicate the transfer rate of core data in the actual data messages. Even with a high apparent speed, depending on the communication means, the secondary data bits might take up the lion's share of the capacity, thus hindering efficient diagnostic and control functions.

Apparent savings in investment phase moved to engineering and support after start-up. Application engineering requires a lot of unique solutions for different paper making processes and different machines. Software engineering is the process automation expert's daily bread. A competent automation specialist, with a reasonable knowledge of drives, has enough process know-how to make design specifications for drives functionality. Focusing on the explicit drive control needs of difficult process parts and the different requirements mentioned above already present a much higher challenge, which may not, though, necessarily be overwhelming. In-depth focus on drives is necessary. But the unique nature of the solution might create a hurdle. A unique solution often has an unpredictable cost impact on engineering. It might lead to unexpected re-engineering needs - most probably in start-up, fine tuning or later, in production batch changes.

Without carefully and widely standardised solutions, making changes and obtaining support can be difficult or time consuming. To construct these standards will take hundreds of projects, and to build up a skilled global support network requires dozens of engineers and experts - not programming experts, but drives application experts. Regardless of whether drive controls are integrated or not, an



Incomplete functionality will cause an increasing need for support during the investment life cycle.



AspectObject™ system facilitates seamless millwide integration.

application expert is needed. Also when a wide expert network exists, a vast amount of feedback from a wide range of applications can be used to make standardised solutions.

Increasing efforts are nowadays being made to create remote services and remote diagnostics. This can be efficient only when supported by efficient tools, unrestricted data access, proper in-depth expertise and adequate resources. Whether the solution to any problem is found quickly or not depends on the in-depth focus area of the expert. Usually human limitations are a hindrance to the possession of a very wide area of in-depth expertise by one person along the whole process, machine control and drive chain. Consequently, with an increasing amount of information available, the intelligent diagnostic systems will play an increasingly important role in the future. To create automated system intelligence, experience and in-depth know-how must be extremely solid. The expression "seamless integration" will take on a new meaning.

Uniformity - including documents and all?. Uniformity in simple terms means the same look and feel of controls, parts, documents, configurations and tools. To achieve this, some degree of engineering and display programming is required from the customer. The same look & feel can be easily engineered in operator displays. Such 'integrations' have often been effected to help system runnability. However, true integration goes further: the uniformity must include e.g. a name-based configuration of drive systems, quality control systems, web inspection systems and process controllers. It should include data collection between systems by uniform interfaces: having the OPC interface brings us only halfway there, since it must be pre-designed with detailed uniformity, too. Different diagnostic, programming and maintenance tools attached to one system platform should work in a uniform manner. One whole subject in its own right is in-

depth product documentation, which ought to be available directly from system servers. It requires a significant development effort even to create a uniform documentation for such a wide range of products as those included in process, drive and machine controls. From the drives point of view it is a great advantage to link HW and application SW using ABB's AspectObject™.



ABB's IndustrialIT AspectObject™ system linked to the DriveIT.

ABB's automation and drive platforms have included characteristics such as the Drive Support tool, & ABB's IndustrialIT solutions adds to these features.

Thanks to the uniformity of the ABB Drives and Automation solutions, ABB's customers can obtain 24h 365d paper machine drive application support worldwide.

Scalability to add processor capacity.

Until now, optimising the investment cost has driven the development of distributed control systems. When the industry is facing faster order delivery cycles, tighter control of assets, a faster development pace for new paper types and even new functionality of paper products, a new kind of flexibility in production processes is required. Whether integrated control has a better response to these requirements than a small-scale system is not so self-evident. Broader information availability by integration merely gives access to a vast amount of process data. Increasing intelligence in field devices add to that information handling load. Intelligent filtering in the middle controller layer is justified, if not essential. Furthermore, if that intelligence is capable of polling automation components external to itself and it detects possible problem causes, the system serves machine availability even better than the merely combined control of different functions. For example, ABB's AdviselT for Operator Diagnostics is a tool, or module designed to probe the drive status and a combination of desired external signals. The middle controller layer is, of course, replaceable by a fully integrated solution providing that the functionality remains equal.

The commercial advantages of the scalability of the system are quite obvious, depending on the scope of the investment or rebuild.

IndustrialIT - the true Integration Story

Integration of process, machine & drive controls must not lead to moving costs pocket to-pocket, or shifting costs to a later point in the paper machine life cycle. It is difficult to see the whole life cycle at the beginning of an investment and this must not be merely a matter of blind faith. True integration can certainly be a giant leap to better paper making processes and customer success. If all the pitfalls are realised and poorly supported solutions can be avoided, the anticipated cost efficiency can be achieved.

When the options are carefully studied, the dedicated drive system controller can often be the most practical solution, especially if seamless compatibility to the other parts of process automation is ensured.

From the customer's point of view the main focus is normally on production volume, product quality and the life time cost of the system. Factors to be taken into account when deciding on the paper machine drive control and integration in other systems must include:

Functionality

- Ability of control system to perform fast drive functions
- Reliability of control system
- Ease-of-use and runnability of the paper machine (e.g. Object and Aspect system to navigate all the elements)
- Availability of Drives data at Control level
- Documentation of Drives and Control
- Uniformity of all basic tools for design and maintenance
- Intelligent data logging tools
- Readiness for remote diagnostics
- Productisation level of drives HW and application SW
- Uniform procedures for project execution
- Safety requirements (Machine Directive)
- Availability of local certified personnel
- 24h/365d application support
- Process Application Services

Life cycle cost

- Control HW + Inverter HW
- Commissioning cost
- Start-up on time
- Maintenance cost
- Cost of updates and revisions of HW & SW
- Cost due to unplanned stops.

ABB rated among the world's most socially responsible companies



ABB retained its place in a list of the world's most socially responsible companies compiled by FTSE, a creator of indices for investors including the U.K.'s benchmark FTSE 100. ABB is part of the FTSE4 Good family of companies selected for their social, environmental and human rights record. Coca Cola, Hitachi, Statoil and Deutsche Bank are among the other companies included in the indices. FTSE, which is jointly owned by the Financial Times and the London Stock Exchange, introduced the FTSE4 Good series of indices five years ago to facilitate investment in companies that meet its criteria for social responsibility.

ABB helps earthquake victims in Indonesia



ABB employees had just completed a project in Yogyakarta on the Indonesian island of Java when a powerful 6.3 magnitude earthquake struck the area. They immediately began to help relieve the suffering of the homeless and injured. Within seconds, at least 600,000 people lost their homes. Not only were trucks and pickups from the ABB construction site put to good use, but ABB employees pitched in to help out personally.

The pickups helped drive doctors to remote locations, enabling them to provide direct local assistance and carry the sick and injured to hospitals. The trucks were used to transport food and relief supplies from government collection points to areas affected by the earthquake. Two soldiers were assigned to each of our trucks for protection against looters. In addition, the Power Division Service unit pledged 25,000 Euros to help the Indonesian earthquake victims.

ABB helps fulfill primary school dream in Bangalore

The NGH school for economically and socially disadvantaged children, supported by ABB on the outskirts of its Bangalore production hub, was bursting at its seams with the strength rising to nearly 1000 students from to Grade 1 - 7 (Ages 6-13). ABB stepped in to support the school authorities and the local community to help construct and commission an extension in the form of a separate primary block which was recently inaugurated by Biplab Majumder (Head AP Division & COO, ABB India). The Primary School block comprises six classrooms and will house around 300 children aged 6-8 yrs. (Grades 1-3). Besides construction of classrooms, the project included provision of drinking water, washrooms, furniture and other basic infrastructure. Several community members, including the President of the school development committee, the village head, the principal, teachers and students of the



school were present on the occasion. After the ribbon cutting and lamp lighting ceremony, the children sang an invocation song. Mr. Huchappa, the school Principal thanked ABB for the timely and ongoing support and the teachers pledged to continue working for this vital cause. ABB supports ten such schools around the country in different ways.

ABB sets up computer lab in North Karnataka



In line with ABB's philosophy of making a difference to the communities it operates in, ABB India recently helped set up a new computer lab and made computers available for the Government

First Grade College in Holenarsipura Taluk, Karnataka. The Hon'ble Chief Minister, of Karnataka, Shri HD Kumaraswamy and Power Minister, Shri HD Revanna inaugurated the lab at a ribbon cutting ceremony attended by ABB representatives, the Principal and students.

"I am happy to see that corporates are taking initiatives to help enhance the quality of education in towns such as Holenarsipura. I must thank ABB for taking the initiative to help set up the much needed computer lab at this college", said Shri HD Kumaraswamy, at the gathering

Emation, Hyderabad

How long have you been an ABB channel partner?

We have been an ABB channel partner for over eight years, dealing primarily in PLCs and drives. We have also recently begun dealing with some of ABB's LV range of products like soft starters and switchgear.

What are some of the benefits of being an ABB channel partner?

ABB commands good brand equity in the market, making it easier for us to sell the products. They have very sound technology and product features. ABB's online management system is good and we use it regularly. However I do feel there needs to be some improvement with respect to database management

How has business been in recent times? And what is the potential?

Business has been good. Most of our customers are in the Pharmaceutical, Heating Ventilation Air Conditioning (HVAC) and packaging/material handling business. The industry is positive and we are looking



at increasing our business. Currently we see buoyancy in the pharmaceutical business. We would gradually like to partner ABB in their Building Management Solutions business as well. We can definitely help much more in the pharma sector, as the partnership strengthens in different areas and products.

We do see potential in the commercial building segment and there seems to be growth in the pulp and paper industry as well. Last year we grew at 60% but this year we are being conservative and hope to grow around 30%. We are expanding fast and are looking at other locations in Hyderabad and also hope to start an office in Vishakapatnam soon. We are currently 16 people and have a completely networked office with high speed internet connectivity.

Personal Fact File



Name: R. Surender
CEO

Family:
Wife and two children

Hobbies:
Relaxation, book reading

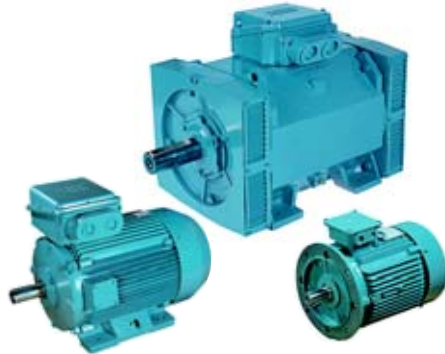
Life philosophy:
Must maintain a work-life balance. Business is just a part of life and we must be content with what we have.

Agarwal Engineering Sales & Service, Hyderabad

Agarwal Engineering Sales & Service (AESS) has been an ABB channel partner since 1980 and deals with ABB's wide range of motors. Mr Rajendra Agarwal, proprietor, AESS says, "Initially the motor business was very small but it has grown over the years. I am proud to say that we have grown with ABB. ABB has one of the widest range of motors in the market today."

Commenting on the business growth, Mr Agarwal, says "We have been consistently growing at a rate of 35% over the last 3-4 years and hope to maintain this growth in the next couple of years. Our business is very service oriented and ABB has supported us well with their engineers and timely attendance to problems. Along with ABB, we have focused on building customer loyalty and today most of our customer relationships are over 15 years old."

Mr Agarwal's son, Rajeev oversees the day to day operations of AESS and is responsible for leveraging ABB's online channel partner system. Talking about placing orders online, he says "We have been using the online system for over 4 years now and process our orders through this system. Though the system is effective, there is scope for faster processing and delivery conversion to be quicker."



Personal Fact File



Name: Rajendra Agarwal
Proprietor

Family:
Wife and two children

Hobbies:
Badminton, playing cards and walking

Life Philosophy:
We should live with respect. Money is not everything

Precision welding

A laser-welding system using two ABB IRB 140 robots is helping to build the world's largest particle physics accelerator - the Large Hadron Collider (LHC) at the European organization for Nuclear Research (CERN) in Switzerland. The IRB140 has one of the fastest cycle times of any articulated robot. On completion in 2007, the LHC will consist of two 27 kilometer tubular rings in a large tunnel 100 meters underground, and be used to recreate conditions in the universe just after the Big Bang.

Welding applications are extremely demanding. A single detail in the assembly requires 0.3 mm diameter spot welds every 1mm in axial length. Welds are only 30 microns in diameter and must be centered within 10 - 15 microns to be effective.



Productivity with NEMESIS



ABB's NEMESIS (Novel Enterprise Manufacturing Execution and Scheduling Information System) is a powerful data - gathering and analysis tool that supports production managers in their task of finding and alleviating weaknesses in the production process. It permits existing plants to produce more goods, to a higher quality, at lower cost and in a more responsive manner.

NEMESIS covers plant scheduling, execution, quality management and reporting. Orders are automatically transferred from the plant's ERP system to scheduling system, to be scheduled against the current factory load. The system helps increase plant visibility and flexibility, which can permit an informed and safe reduction of inventory levels.

E-panel – a revolution in medium-voltage switchgear

Universally recognized as a paradigm shift in communications technology for power distribution systems, ABB's waveguide concept enables medium-voltage switchgear to communicate data via electromagnetic waves without the use of electrical or optical links. Data is transmitted at almost the speed of light and without interference and transmission loss.

ABB is launching the technology in the ZX family of medium-voltage gas insulated switchgear under the name E-panel. Modules equipped with waveguide are able to communicate with their entire environment in accordance with the IEC 61850 standard.



IEC 61850 compliant substation equipment



ABB is set to be the first maker of substation automation equipment to have a complete set of products based on the same platform that comply with a global standard set in 2004 by the International Electrotechnical Commission. The IEC 61850 standard reduces complexity by introducing a single language where many existed before, reducing the potential for errors and delays in projects.

Having a single standard therefore helps customers lower maintenance and operating costs. ABB's equipment can be used with any other that complies with the new standard and can be reconfigured for new applications, giving the customer long-term flexibility by ensuring that installations can easily be expanded or modified in future.

You ask - We answer

Please share some more details on the innovative plug-in technology for reliable, safe and maintenance free power.

*Mr Tapash Roy,
Dy Manager, CESC Ltd*

The ZX series leaves the ABB factory as completely tested panels, due to the plug in busbar system. The SF6 switchgear is exemplary in terms of safety, economy and availability. Their compact design permits installation even in the most constricted spaces. The hermetically sealed stainless steel enclosures make the systems shockproof and protect the high voltage components from all environmental influences, providing maximum availability over the entire life span of the switchgear.

Communicating

Powering the Railways Brochure

Power Systems Consulting Brochure

Power Systems Consulting Fact Sheets

Code of Conduct Brochures

Code of Conduct Posters



Relay Brochures

Instrumentation Posters

Recent Media Coverage

INDIA'S FASTEST GROWING COMPANIES
RANK 5
 Our strategic initiatives have yielded good results. We have succeeded in realigning our portfolio mix in terms of projects, products & services from 80:20 to 60:40 thereby creating three strong legs and lending base load stability. Our standard products strategy has paid rich dividends and we continue to

ABB India plans biz diversification
 BUSINESS NEWS
 Speaking to ET, Ravi Tyagi, vice-chairman & MD, ABB India, said, "We are planning to hire about 100 people within this year against 800 last year," he adds. "There are plans to increase the number of scientists, engineers and domain experts from 150 to 700 at the R&D centre in Bangalore." The company also intends to increase the number of engineers at the recently established Global Operations Engineering Centre at Chennai in Bangalore, which is fully functional with around 250 engineers.

ABB signs MoU with IIT Delhi for R&D in automation
 Bangalore: ABB in India has signed an MoU with the Indian Institute of Technology, Delhi (IITD), further strengthening its relations with one of the world's leading technology institutions. This includes multiple initiatives aimed at furthering research and

Employee Engagement P C Rajiv Welcome to the 'Real' world
 AS India strives to become a global economic force with a GDP growth target of 8-10%, single digit economic growth in order to build this vision. Moreover, in order to ensure that our growth is sustainable, we will have to break out of the mindset that the 'service' sector alone can get us there. Our domestic growth coupled with the crying need for infrastructure development puts significant demands on the

"We are presently enhancing our range and product portfolio in India"
 ABB is recognized as a leader in power and automation technologies worldwide. The increasing growth of the power industry in the past few years has added new challenges in the electrical system power and automation technology sector. In a recent conversation with Mr. Suresh Mohan, MD, India, at ABB India, the Indian Representative of ABB, Mr. Suresh Mohan discussed the growth of the power industry in India and the demand for infrastructure development in the past few years.

ABB net profit up 65 pc to Rs 72 cr
 ABB India's net profit for the first nine months of 2010 has risen 65% to Rs 72 crore, compared to Rs 43.5 crore in the same period last year, according to the company's annual report. The company's revenue for the same period was Rs 1,000 crore, up from Rs 850 crore last year.

Rank	Company Name	Revenue (Rs Cr)	Profit (Rs Cr)
1	Infosys	10000	1000
2	TCS	8000	800
3	Wipro	6000	600
4	HCL	5000	500
5	ABB	1000	72

The last word

India's economic growth and industrial resurgence continues to gather momentum. We hope you enjoyed this issue of CONTACT, focused on the Pulp & Paper sector, in addition to our regular features. We welcome your feedback as we continue to strive towards enhancing your reading pleasure through this shared knowledge platform.



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

www.abb.co.in/contact

No room for weak links.



ABB products strengthen grid reliability.



From the leading performance of the new 245kV, 63kA, two-cycle interrupting 245PMG-B circuit breaker that eliminates the need for external capacitance to state-of-the-art switchgear and transformer solutions, ABB Power Products

redefine reliability. And we back that reliability with the peace of mind of global sourcing capabilities and the expertise and services that help optimize performance and product life. That's why ABB holds the world record in switching high amps - 200,000 - with its generator circuit breaker. **To learn more about the strength of ABB, visit www.abb.com.**

Power and productivity
for a better world™

