



## **Important information regarding the ABB 2003 Annual Report consolidated figures**

During the second quarter of 2004, ABB received information regarding earnings overstatements by the medium voltage business unit of ABB's Power Technologies division (the "PT-MV BAU") in Italy.

The cumulative effect of these overstatements on ABB's earnings before interest and taxes and net income was approximately \$73 million and \$89 million, respectively, from the first quarter of 1998 through the end of March 2004.

For further information please refer to the Form 20-F/A that was filed by ABB Ltd ("ABB") on September 24, 2004 as Amendment No. 1 to its Annual Report on Form 20-F filed on April 9, 2004 (the "Original Form 20-F").

The Amendment No. 1 amends and restates the following Items of ABB's Original Form 20-F:

- "Item 3–Key Information"
- "Item 4–Information on the Company"
- "Item 5–Operating and Financial Review and Prospects"
- "Item 8–Financial Information"
- "Item 15–Controls and Procedures"
- "Item 18–Financial Statements"
- "Item 19–Exhibits".

The Form 20-F/A can be downloaded from the ABB website at [www.abb.com](http://www.abb.com).





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### Caution concerning forward-looking statements

The ABB Group Annual Report 2003 includes forward-looking statements. In the Operational review, such statements are included in "Letter to shareholders," "Chief financial officer's report," "Power Technologies," "Automation Technologies" and "Human Resources" and in the Financial review, such statements are included in "Management discussion and analysis." Additionally, the words "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "expect," and similar words are intended to identify forward-looking statements. We have based these forward-looking statements largely on current expectations and projections about future events, financial trends and economic conditions affecting our business. These forward-looking statements are subject to risks, uncertainties and assumptions, including among other things, the following: (i) the difficulty of forecasting future market and economic conditions; (ii) the effects of, and changes in, laws, regulations, governmental policies, taxation, or accounting standards and practices; (iii) our ability to dispose of certain of our non-core businesses on terms and conditions acceptable to us; (iv) our ability to manage our liquidity and further reduce our indebtedness as planned; (v) the resolution of asbestos claims on terms and conditions satisfactory to us; (vi) the effects of competition in the product markets and geographic areas in which we operate; (vii) our ability to anticipate and react to

technological change and evolving industry standards in the markets we operate; (viii) the timely development of new products, technologies, and services that are useful for our customers; (ix) unanticipated cyclical downturns in some of the industries that we serve; (x) the risks inherent in large, long-term projects served by parts of our business; (xi) the difficulties encountered in operating in emerging markets; and (xii) other factors described in documents that we may furnish from time to time with the U.S. Securities and Exchange Commission, including our Annual Reports on Form 20-F. Although we believe that the expectations reflected in any such forward-looking statements are based on reasonable assumptions, we can give no assurance that they will be achieved.

We undertake no obligation to update publicly or revise any forward-looking statements because of new information, future events or otherwise. In light of these risks and uncertainties, the forward-looking information, events and circumstances might not occur. Our actual results and performance could differ substantially from those anticipated in our forward-looking statements.

## About ABB

ABB ([www.abb.com](http://www.abb.com)) is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries.

ABB is headquartered in Zurich, Switzerland. ABB Ltd shares are traded on the stock exchanges in Zurich/London, Stockholm, Frankfurt and New York.

The ABB Group was formed in 1988, when the Swedish Asea and the Swiss BBC Brown Boveri merged under the name ABB. Asea's history dates back to 1883. BBC Brown Boveri was founded in 1891.

 To find out more, visit: [www.abb.com/about](http://www.abb.com/about)



## Key figures and highlights

Core businesses post strong results

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### 2003 highlights

- Power and automation businesses exceed profitability targets
- Capital strengthening program a success
- Mainly non-cash losses in Discontinued operations biggest factor in full-year net loss
- Core divisions generate cash from operations of almost \$1.5 billion
- Major steps taken in divestment program

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Group revenues  
(2002 \$17,466m)

\$18,795m

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Group EBIT  
(2002 \$346m)

\$656m

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Net loss  
(2002 \$783m)

\$767m



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Analyst and investor inquiries e-mail:  
[investor.relations@ch.abb.com](mailto:investor.relations@ch.abb.com)

## Revenues by region



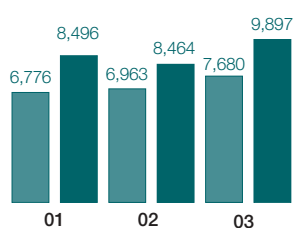
- 1 Europe **55%**
- 2 The Americas **19%**
- 3 Asia **18%**
- 4 Middle East and Africa **8%**

## Employees by region

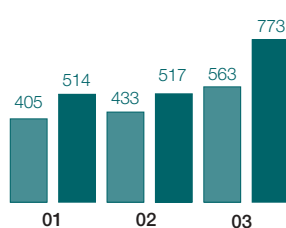


- 1 Europe **61%**
- 2 The Americas **16%**
- 3 Asia **13%**
- 4 Middle East and Africa **10%**

## Core division revenues (\$ millions)



## Core division EBIT (\$ millions)



## Total ABB Group

Year ended December 31 (U.S. dollar amounts in millions except per share and % data)

	2003	2002
Orders received	<b>18,703</b>	17,352
Revenues	<b>18,795</b>	17,466
Earnings before interest and taxes (EBIT)	<b>656</b>	346
Loss from discontinued operations	<b>(853)</b>	(858)
Net income (loss)	<b>(767)</b>	(783)
Stockholders' equity	<b>3,026</b>	1,013
Capital expenditure, excluding purchased intangible assets	<b>399</b>	436
Research and development expenditure	<b>613</b>	547
Order-related development expenditure	<b>317</b>	248
EBIT margin	<b>3.5%</b>	2.0%
Return on equity	<b>(38.0%)</b>	(52.4%)
Net cash flow from operating activities	<b>(161)</b>	19
Number of employees	<b>116,464</b>	139,051

## Basic earnings (loss) per share

Income (loss) from continuing operations	<b>0.07</b>	0.07
Net income (loss)	<b>(0.63)</b>	(0.70)

## Diluted earnings (loss) per share

Income (loss) from continuing operations	<b>0.07</b>	(0.10)
Net income (loss)	<b>(0.63)</b>	(0.83)

# Letter to shareholders

Chairman and CEO, Jürgen Dormann

Technology key to turnaround



**Jürgen Dormann**  
Chairman and CEO  
"To safeguard ABB's technology edge, we increased investment in research and development to \$930 million in 2003 from \$795 million in 2002."

## We had another challenging year at ABB. The turnaround is progressing well.

Our core Power Technologies and Automation Technologies businesses delivered significantly higher earnings before interest and taxes (EBIT) and cash flow in 2003.

Peter Smits, head of Power Technologies (see page 13), and Dinesh Paliwal, head of Automation Technologies (see page 21), increased efficiencies and performance to produce solid EBIT margin improvements. In early 2004, they further streamlined their businesses with an eye to ensuring future profitable growth.

And despite mixed markets, reported orders and revenues for the full year 2003 continued to grow. This is a clear sign that our customers continue to rely on our high quality products, systems and services – to increase performance with lower environmental impact, less use of natural resources and less waste.

### Achievements

- Core division EBIT up 40 percent
- Raised more than \$4 billion in capital markets
- Total debt reduced on target
- Gearing ratio (total debt divided by total debt plus stockholders' equity including minority interest): 70 percent in 2003
- Lowered cost base by \$655 million

### Targets\*

- Revenues: four percent annual average growth in local currencies 2002–2005
- EBIT margin: eight percent in U.S. dollars by 2005
- Total debt: \$4 billion by year-end 2005
- Gearing ratio (total debt divided by total debt plus stockholders' equity including minority interest): 50 percent in 2005
- Lower cost base by \$900 million by mid-2004

\* Revenue and margin targets exclude major acquisitions, divestments and business closures.

### Investing more in R&D

To safeguard ABB's technology edge, we increased investment in research and development to \$930 million in 2003 from \$795 million in 2002. That's around five percent of revenues. We turned out a large number of new products from our ten research programs this year. A list of our 50 groundbreaking ABB technologies is published in this report (see page 29).

Peter Voser, our chief financial officer, led a key achievement in 2003, firming up our balance sheet with a three-part financing plan. It involved a capital increase, a bond offering and a new credit facility (see page 6 for more information). The positive reception in financial markets was another sign of confidence in ABB. Thank you for your support in this initiative. Total debt was reduced on target including the bond issue in December 2003.



### Net loss and reducing costs

Alongside all this good news we posted a net loss in 2003. Mainly non-cash losses in Discontinued operations – in the downstream oil and gas and reinsurance businesses – were the biggest factors in the full year \$767 million net loss. Agreements to divest parts of these businesses have been concluded and the sales are expected to close in 2004, subject to certain conditions.

Taking into consideration the net loss reported for the year, the board of directors proposes that no dividend be paid for 2003.

Gary Steel, head of human resources (page 30), led the Step change cost reduction team, which saved us \$655 million for the full year, ahead of our target of \$900 million by mid-2004.

The combination of divestments and cost reductions puts ABB on a much stronger footing. We are lean at around 115,000 employees compared to 146,000 when we started the cost reduction – and divestment – programs, which means we are nimble and positioned for profitable growth. We also have the right leaders and the right corporate governance charter (page 38) in place to foster sound management.

### Market development and strategy

Based on current estimates, we expect demand in most markets to continue to grow in 2004 compared to the year before, especially in the second half of the year. Economic growth in Asia is expected to remain robust, and a recovery is forecast to begin in Europe and the U.S. later in the year.

We believe that this market development, combined with continued planned cost reductions and divestments, will lead to a further improvement in profitability in 2004 compared to 2003.

Now, some information on our strategy. In the last 12 months, we have conducted a thorough review

of global market dynamics and our core strengths. We found that we only need to fine-tune operations – not overhaul our portfolio. We will not base growth on major acquisitions or dramatically diversify our strong set of core power and automation technologies.

We will migrate part of our operations base from Europe, where we are over-invested, to higher-productivity parts of the world like Asia. Quality remains paramount, regardless of where we make our products. Each and every product must meet “Made in ABB” standards. To facilitate this cost migration, we must transfer technology know-how. We have had good success transferring technology from Switzerland, Germany and Italy, for example, to ABB factories in Vadadora, Beijing and Xiamen. You will see more of this.

And, we will better manage the U.S. market. We have moved our automation technologies headquarters to the U.S. and teamed senior managers in the U.S., Canada and Mexico to better tap the potential of the North American markets.

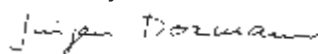
### The power of our people

Our strengths are in technology and our pioneering spirit. We contribute to economic, environmental and social development wherever we do business. Measuring our performance on the so-called triple bottom line (see page 32), we are putting ABB back on the path to profitable, sustainable growth.

On behalf of the board of directors, and on behalf of you, our shareholders, I would like to thank our employees. Their skills, dedication to our customers and fighting spirit have seen us through these difficult times.

Together, we are looking forward to a better year ahead.

Sincerely,



Jürgen Dormann  
Chairman and CEO, ABB Ltd



# Chief financial officer's report

## Peter Voser

### Strengthening the balance sheet

**In 2003, the two core divisions continued to improve their profitability in challenging markets and exceeded their profit margin targets for the year. Most of the improvement came from permanent cost reductions of more than \$400 million – \$655 million for the ABB Group as a whole – through the Step change program. Higher earnings together with improved working capital resulted in significantly stronger cash flow.**

These strong operational results go hand in hand with the success of our finance strategy, aimed at rebuilding the balance sheet and providing the liquidity our core divisions need to secure long-term growth and profitability. This strategy had two elements: the divestment of non-core businesses, using the proceeds to pay down debt; and a capital strengthening program carried out in the second half of 2003.

#### **Divestment program**

In 2003 we sold most of the Building Systems business, most of our remaining Structured Finance business, parts of our Equity Ventures portfolio, and all of our renewable energy investments. These transactions generated more than \$1.2 billion in cash proceeds.

We also announced two further divestments that we expect to close by the middle of 2004. One is the sale of our upstream oil and gas business for an initial purchase price of \$925 million and a potential deferred consideration of up to \$50 million. The sale is subject to the customary approvals and the completion of compliance matters under review.

The other divestment was our reinsurance business. In addition to generating cash proceeds of about \$425 million, this divestment will remove insurance-related assets and liabilities that have made it difficult for our investors to truly assess the quality of our balance sheet. These included, for example, some \$1.7 billion in cash and marketable securities that were tied to insurance obligations and not available to the rest of the company.

#### **Capital strengthening program**

The capital markets side of our strategy was initiated in August with the successful launch of a CHF 1 billion (around \$750 million) convertible bond. The issue was eight times oversubscribed, an encouraging reaction to our first step back into the capital markets.

This set the stage for our \$4 billion, three-pillar capital strengthening program, launched in November. The heart of the program was a CHF 3.1 billion (approximately \$2.5 billion) rights issue. Again, the market responded favorably and more than 99 percent of the rights were converted into ABB shares. The second pillar was the launch of a euro 650 million (around \$750 million) straight bond, which was five-times oversubscribed. Finally, we negotiated an unsecured \$1 billion credit facility as a back-up instrument. We did not intend to draw on it and have not done so. We have since paid back and cancelled the previous \$1.5 billion secured bank facility.

Our capital strengthening measures and the cash proceeds from divestments have brought our balance sheet back to levels appropriate to run a global industrial company. We have reduced our net debt, defined as total debt less cash and marketable securities, to about \$2.7 billion from more than

\$5 billion at the end of 2002. Shareholders' equity increased to more than \$3 billion at the end of 2003 from just over \$1 billion at the end of 2002. Our gearing level, defined as total debt divided by total debt plus shareholders' equity including minority interest, has been cut to 70 percent, our target for the end of 2003. Our long-term debt repayments of some \$600–800 million a year can now be met through the cash flow from operations of our core divisions.

## Outlook

With this stronger balance sheet, ABB has given its two core divisions, Power Technologies and Automation Technologies, the solid base they need to capture future business opportunities as the expected economic recovery begins to take hold.

Our eyes are now on our 2005 finance targets, which remain unchanged: total debt of \$4 billion and gearing of 50 percent. We will drive our finance strategy forward in 2004 with these goals in mind. We intend to pay down debt and, on the divestment side, to sell the remaining Building Systems business in Germany this year, along with the downstream oil and gas business. Once these transactions are done, the divestment program will be essentially complete. ABB's improved financial situation will allow us to divest the remainder of our Equity Ventures portfolio when we can get the best value. Our aim remains to regain ABB's investment grade credit rating as soon as possible.

Our efforts to strengthen ABB's financial base, and the strong operational performance of our core divisions, were rewarded with renewed investor confidence in 2003. This year, the focus will remain on operational excellence linked to a solid capital structure. We believe this is the right strategy to secure long-term growth and profitability.

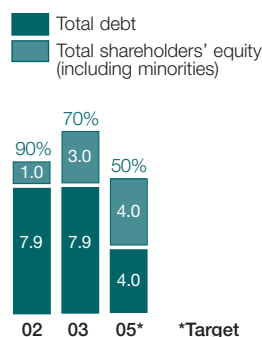


**Peter Voser**

Chief financial officer

"Our capital strengthening measures and divestment program have brought our balance sheet back to the levels needed to run a global industrial company."

Gearing levels (\$ billions)



Our gearing level, defined as total debt divided by total debt plus shareholders' equity (including minorities), has been cut to 70 percent, our target for the end of 2003. For 2005, our gearing target remains 50 percent, on gross debt of \$4 billion.

## ABB's executive committee

### The management team

From left to right:  
Peter Voser,  
Peter Smits,  
Jürgen Dormann,  
Dinesh Paliwal  
and Gary Steel.



### **Jürgen Dormann**

#### **Chairman and CEO**

German citizen, 64, joined ABB as a board member in 1998, became chairman in late 2001 and CEO in late 2002.

### **Peter Voser**

#### **Executive committee member and CFO**

Swiss citizen, 46, joined ABB as CFO in early 2002, has a stewardship role for Switzerland and the Middle East and Africa.

### **Peter Smits**

#### **Executive committee member and head of Power Technologies**

German citizen, 53, joined ABB in 1980 and became a member of the executive committee in January 2001. Has a stewardship role for China, Russia and Europe (except the U.K., Ireland and Switzerland).

### **Dinesh Paliwal**

#### **Executive committee member and head of Automation Technologies**

Indian citizen, 46, joined ABB in 1985 and became a member of the executive committee in January 2001. Has a stewardship role for India and the Americas. Country manager for ABB in the U.S.

### **Gary Steel**

#### **Executive committee member and head of Human Resources**

British citizen, 51, joined ABB in January 2003, has a stewardship role for North, Central and Southeast Asia and Pacific, the U.K. and Ireland.

## ABB at a glance

### Sharpening our focus on power and automation technologies

The Power Technologies division has merged two business areas into one to pursue productivity and efficiency gains. The former Distribution Transformers and Power Transformers business areas, which shared many locations, were merged to form a single Transformers business area. The merger should help reduce product overlaps, enable more efficient research and development, and improve supply chain management.

The Automation Technologies division has merged six business areas into three, also to increase productivity and cut costs. The former Control Platform and Enterprise Products, Paper, Minerals, Marine and Turbocharging, and Petroleum, Chemicals and Consumer business areas were combined to form one Process Automation business area. The former Drives and Motors and Low-Voltage Products and Instrumentation business areas were combined to form one Automation Products business area. And, lastly, the Robotics, Automotive and Manufacturing business area was renamed Manufacturing Automation.

The organizational changes took effect January 1, 2004.

ABB signed a final agreement to sell the upstream business in its Oil, Gas and Petrochemicals division to a consortium of equity investors, which is expected to be complete in 2004. The downstream business is also intended for divestment in 2004. Both are reported under Discontinued operations, which do not contribute to ABB's revenues and earnings before interest and taxes (EBIT), but are used in the calculation of net income.

## Power Technologies

### Division head

Peter Smits

ABB Power Technologies serves electric, gas and water utilities, as well as industrial and commercial customers, with a broad range of products, systems and services for power transmission, distribution and power plant automation.

### Business areas

- Transformers
- Medium-Voltage Products
- High-Voltage Products
- Power Systems
- Utility Automation Systems



ABB pioneered switchgear technology, used by utilities to switch electric current, and remains a world leader in both technological innovation and market share.



To find out more visit: [www.abb.com/ptd](http://www.abb.com/ptd)

## Automation Technologies

### Division head

Dinesh Paliwal

ABB Automation Technologies blends a customer-focused product, service and system portfolio with end-user expertise and global presence to deliver solutions for measurement, control, motion, protection, and plant optimization across the full range of process, discrete and utility industries.

### Business areas

- Automation Products
- Manufacturing Automation
- Process Automation



Variable speed drives from ABB improve the efficiency of electric motors. They save enough energy to power millions of homes and businesses while eliminating more than 60 million tons of CO<sub>2</sub> emissions a year.

 To find out more visit: [www.abb.com/atd](http://www.abb.com/atd)

## Other activities

### Discontinued operations

- Reinsurance
- Oil, Gas and Petrochemicals
- Asbestos
- Other divested businesses

### Non-core activities

- Equity Ventures
- Remaining Structured Finance
- Building Systems
- New Ventures

### Corporate

- Headquarters/stewardship
- Research and development



## Power Technologies

We make power possible

ABB produces more than half a million transformers per year. This high-end, 330-ton transformer was built in Sweden for a project in the U.S.







**Peter Smits**  
Head of ABB's Power Technologies division  
"We had a good year. The focus will stay on fast deliveries, productivity improvements and high-quality technology."

**ABB Power Technologies serves electric, gas and water utilities, as well as industrial and commercial customers, with a broad range of products, systems and services for power transmission, distribution and power plant automation.**

Power technologies are used to transform, convert or apply electrical power in order to transmit and distribute it to consumers.

The division employs around 39,000 and has 150 manufacturing sites around the world.

**Business areas\* and percentage of revenues 2003**



- 1 Power Systems **28%**
- 2 Medium-Voltage Products **17%**
- 3 High-Voltage Products **16%**
- 4 Utility Automation Systems **15%**
- 5 Power Transformers **14%**
- 6 Distribution Transformers **10%**

\* Effective January 1, 2004, ABB merged its two transformer business areas into one new business area called Transformers.

### Performance 2003

In local currencies, orders up four percent and revenues flat (three percent on a comparable basis). Earnings before interest and taxes (EBIT) up 30 percent in U.S. dollars, EBIT margin up to 7.3 percent from 6.2 percent, and cash flow from operations up 84 percent.

### Market demand 2003

Continued strong growth in Asia, the Middle East and Africa, good growth in Eastern Europe and mixed in Western Europe. Low growth in North America, but signs of upturn in fourth quarter.

**EBIT 2002–2003 (\$ millions)**



**Cash flow from operations (\$ millions)**



### Lowering costs 2003

The Step change productivity improvement program led to around \$200 million in savings in 2003 through personnel costs, overhead, product and site rationalizations, better quality and supply chain management.

### Strategic priorities 2004

Improve cycle times, productivity and costs. Leverage installed base of products and systems to capitalize on retrofit and service opportunities. Target high-growth regions and high-end technologies, for example, to prevent blackouts.

### Targets

Revenue growth of 5.3\*\* percent and EBIT margin of 10.0 percent for 2005.

\*\* Compound annual growth rate 2002 – 2005 excluding major acquisitions, divestments and business closures.

### Major orders and contracts

- 1 Five-year, \$500 million frame agreement for power and automation components with Bombardier Transportation
- 2 \$350 million service contract in the U.K.
- 3 \$90 million flexible AC transmission systems (FACTS) order in U.A.E.
- 4 \$31 million order for power distribution substations in Algeria

To find out more visit: [www.abb.com/ptd](http://www.abb.com/ptd)

# Power Technologies

## Transformers

**The former Distribution Transformers and Power Transformers business areas, which share many locations, were merged to form a single Transformers business area at the beginning of 2004. The merger should help reduce product overlaps, enable more efficient research and development, and improve supply chain management.**

**The combined Transformers business area had revenues equivalent to \$2 billion in 2003 and employs around 13,000 employees in more than 50 factories around the world. Every fourth high-voltage transformer sold in the world is from ABB. The business area sells a wide range of transformers – from single-phase transformers to small, medium and large distribution transformers, reactors, traction, phase-shifting, converter and extra high-voltage transformers.**

### **Keeping the power flowing through Europe**

ABB is helping TERNA, which owns 95 percent of the power transmission network in Italy, import surplus power from France.

The transmission corridor between France and Italy is one of several bottlenecks in Europe, where the existing interconnections are not secure – meaning that failures can cascade through a power grid.

To ease the congestion, ABB is supplying TERNA with two phase-shifting transformers to increase the capacity of the existing lines and optimize the transmission of power through the corridor.

The two transformers will control the flow of power through the interconnection and balance out system overloads and underloads. Weighing 780 tons, they are two of the largest and most powerful transformers that ABB has ever supplied.

Italy imports 15 percent of its electricity, mostly from France and Switzerland, and depends on this link to maintain a high safety margin during peak demand.

### **Diamonds are forever**

ALROSA Co. Ltd. is Russia's largest diamond company, engaged in exploration, mining, manufacture and sale of diamonds. It is also the world's second biggest diamond producer, accounting for some 20 percent of global rough diamond production, operating a number of mines in the Mirny region of eastern Siberia.

Siberia is one of the harshest environments on earth, where severe cold puts enormous stresses on diamond exploration equipment. So when ALROSA built a new diamond washhouse, it installed ABB's unique RESIBLOC distribution transformers.

RESIBLOC is the only dry transformer technology currently used in places where temperatures can fall to  $-60^{\circ}\text{C}$ , a crucial factor leading to the contract.

### **Transforming transformers**

ABB signed a five-year, \$500-million deal with Bombardier Transportation in 2003 for railway components like traction transformers, traction motors, power semiconductors, power electronic products and low-voltage apparatus.

Traction transformers are mounted on locomotives to ensure power supply to the motors. Due to limited space, locomotives have no back-up system, so the transformers must be fail-safe.

This long-term deal captures perfectly ABB's strategy to partner with long-time customers like Bombardier. The two companies are together targeting a reduction in the time it takes to make products and deliver them. They are also sharing design processes to boost production efficiency and streamline business processes.

It is the first such agreement signed by Bombardier with any of its suppliers.

# Power Technologies

## Medium-Voltage Products

**ABB is the recognized market leader in Medium-Voltage Products with \$1.5 billion in revenues and around 7,000 employees. Switchgear and circuit breakers are the key products, which are sold mostly to utilities, industrial end-users and channel partners. The business area develops, manufactures and sells a wide range of circuit breakers and contactors, fuses, sensors, switches, vacuum interrupters and outdoor distribution products. Market coverage is weighted toward Western Europe, North America, Asia and the Middle East.**

### **Switchgear with better communications skills**

Microprocessor-based protection units, such as ABB's REF542plus, bring intelligence to "dumb" medium-voltage substations, combining measurement, monitoring, protection, control and self-diagnosis in one package.

Medium-voltage switchgear is designed to switch down distributed power voltage to levels that are useful to power utilities and heavy industries such as steel works, paper mills and petrochemical plants. These electrical workhorses are all around us – but no longer as conspicuous as they used to be, because they take up less space.

Switchgear is also equipped with circuit breakers that interrupt power, either automatically in case of electrical failure, or manually to allow for maintenance work. These circuit breakers need help to detect a fault before cutting power in a matter of milliseconds. This is exactly what the REF542plus does. It identifies the fault, trips the breaker and alerts the operator of any fault that requires action.

The new release also features SMS support to further help service technicians. Any event registered by the unit can be sent as a regular text message (SMS) to the technician's cell phone. The technician can then connect to the switchgear via the Web, access the unit and analyze the data needed to correct the problem.

### **Helping China prepare for the Olympic Games**

Authorities in Beijing expecting a massive influx of visitors for the 2008 summer Olympic Games turned to ABB for help in expanding the city's metro system.

Beijing's metro system consists of 100 kilometers of track, which can only handle about ten percent of the city's 12 million inhabitants. In advance of the Olympics, city planners are tripling its length.

The Beijing Metro Group hired ABB to provide medium-voltage switchgear to power the new light rail running from Xizhimen to Dongzhimen, part of the municipal government's ongoing ten-year plan to meet the needs of the 2008 games.

"We have to get a lot of people from point A to point B," says Wu Youyou, vice director and senior engineer with Beijing Metro. "ABB's technology is environmentally sound, of high quality and very reliable."

Wu Youyou says eight metro lines are currently under construction or slated for construction.

"The most advanced line in terms of construction is the one where we've partnered with ABB," says Wu Youyou.

In early 2003, ABB also won an \$18 million order for medium-voltage gas-insulated switchgear (GIS) for Guangzhou metro line 3 and Shenzhen metro line 1. It was ABB in China's largest-ever medium-voltage order.

# Power Technologies

## High-Voltage Products

**ABB's High-Voltage Products business area is more than twice as large in terms of revenues as its closest competitor, with revenues around \$1.4 billion in 2003. Around 6,000 people work in the business area, whose products include high-voltage switchgear, high-current systems and cables. Utilities are the biggest customer, followed by channel partners and industrial end-users. We export mostly from Europe to all parts of the world, but have balanced production in Europe, North America and China.**

### **Generator circuit breaker systems set new world record**

With an 80 percent market share, ABB is the world's largest producer of generator circuit breaker systems, which are mainly used to protect generators and power transformers in power plants. We built this position using gas technology like the proprietary self-blast breaker system, which captures energy from the powerful electric arc produced when a circuit is interrupted. This in turn creates sufficient gas pressure to extinguish the arc.

Customers increasingly require the specification, ordering, building and delivery of such equipment to be faster and more efficient.

So ABB created a range of generator circuit breaker systems that over time will replace almost 90 percent of its current offering in this market. Called HECS, or high-energy current system, it's a family of seven modular systems covering the full range of different power station applications, including gas turbine, steam, nuclear or hydro, and power ratings.

The generator circuit breaker systems are compact, and offer extraordinarily high breaking power for their size. They have established a world record in switching high currents up to 130,000 amperes with self-blast technology and are guaranteed for 20,000 close/open operations, compared to 15,000 in the systems being replaced.

The annual market for generator circuit breaker systems is expected to total more than \$100 million a year by 2005.

### **ABB's unique qualifications secure giant power project**

The Bureyskaya hydropower project is the key to economic growth in the Russian Far East – a vast, underdeveloped region that covers the eastern third of the world's biggest country.

When completed in 2009, Bureyskaya will be the biggest power plant in the Russian Federation, with a capacity of 2,000 megawatts.

United Energy System (UES), the national utility, selected ABB to supply gas-insulated switchgear (GIS) for what is officially classified as a project of national importance.

ABB pioneered GIS technology in the 1960s and remains the world leader in both technological innovation and market share.

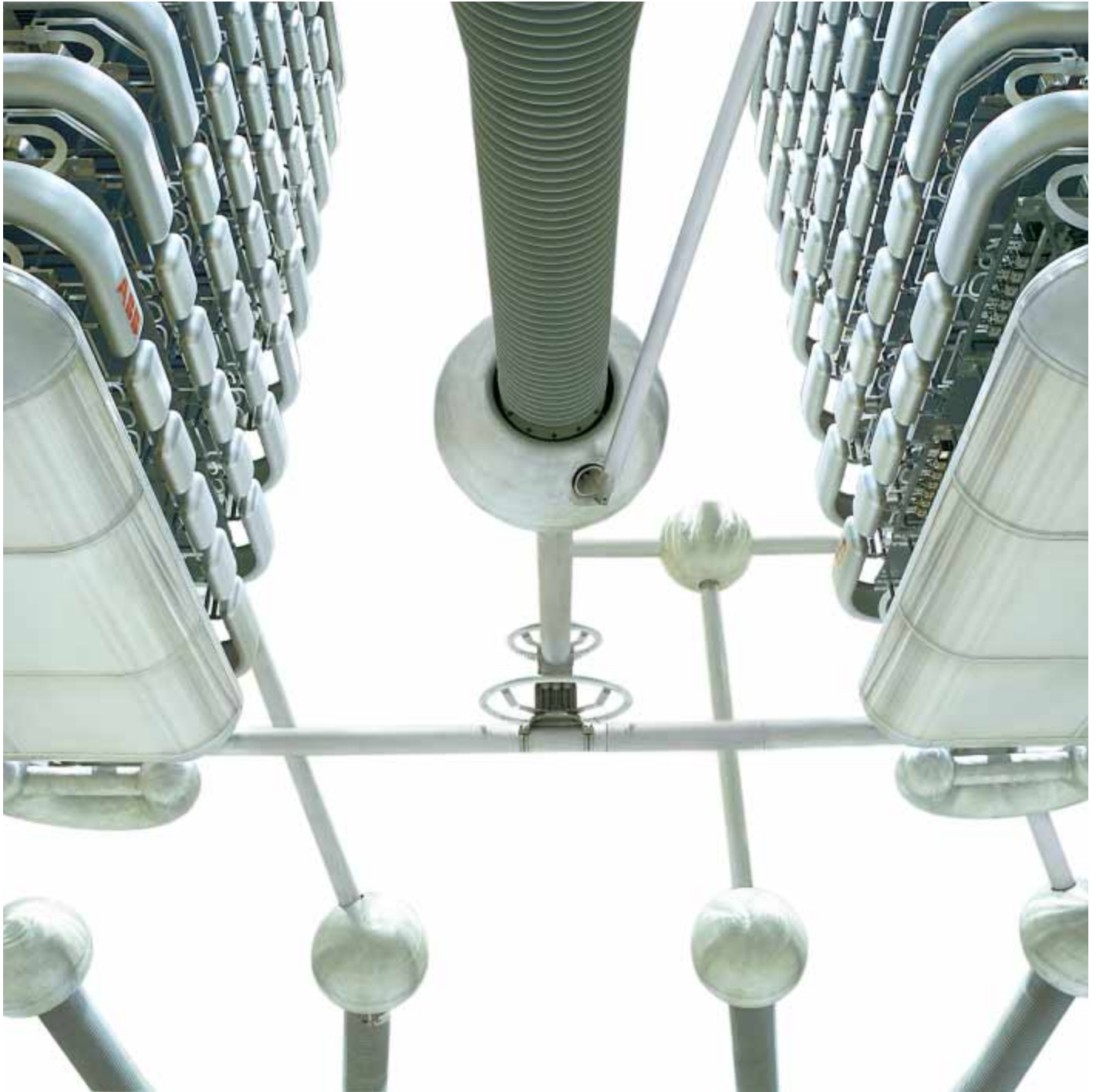
The compact size of ABB's GIS – 90 percent smaller than conventional air-insulated switchgear – is crucial in a hydropower plant where space is severely limited.

In a place where temperatures may drop as low as  $-57^{\circ}\text{C}$  and fluctuate widely from day to day, reliability and secure knowledge that the switchgear meets Russian, as well as international standards, is critically important.

ABB is the only supplier in Russia with extensive accreditation from UES, and the only company to have been given product certification for 500 kV gas-insulated switchgear for compliance with Russian standards.



ABB is the market leader in high-voltage direct current (HVDC) systems like the one pictured here in China. HVDC increases transmission capacity while stabilizing networks.



# Power Technologies

## Power Systems

**ABB is the recognized market leader in Power Systems and the industry benchmark for technology, quality and delivery time. In 2003, the business area had \$2.3 billion in revenues and roughly 8,000 employees.**

**Transmission and distribution substations are key product lines. Power lines, flexible alternating current transmission systems (FACTS) and high-voltage direct current (HVDC) systems, are technologically advanced concepts to increase transmission capacity and stability in power networks, which give ABB its competitive edge. HVDC and FACTS are supported by an in-house power semiconductor factory.**

**The business area sells mostly to utilities, but also to industrial end-users, and is complemented by a consulting and power systems services arm. Orders and revenues are fairly balanced among the Americas, Europe, the Middle East and Africa, and Asia-Pacific.**

### **Getting the FACTS right**

New technology from ABB will improve power transmission by 80 percent in a part of Saudi Arabia that's prone to summer power shortages.

A \$90 million flexible AC transmission system (FACTS) in the Riyadh area will bring more power to consumers at a lower investment cost and with less environmental impact than the alternative: building costly new transmission lines or generating facilities.

ABB will design, manufacture, install and commission four series compensation units in the existing 380-kilovolt transmission corridor between the eastern and central regions of the Saudi Electricity Commission (SEC) grid.

Series compensation is the part of FACTS technology that increases the power capacity of existing grids, while maintaining or improving grid stability.

ABB will also expand a 230-kilovolt substation, install a 300-kilometer high-speed fiber optic telecommunication link, and build an auxiliary power feeder and related equipment.

ABB is a leader in the growing field of FACTS, having won 40 contracts worth more than \$600 million in the past three years.

### **Power to the people**

ABB's high-voltage direct current (HVDC) power transmission link between the Three Gorges dam and Changzhou set a new world record for reaching power levels of 3,300 megawatts on one transmission line in 2003.

The vast majority of China's power generation takes place in the western provinces, but is used in large eastern cities like Shanghai and Guangzhou. Yuan Qing-yun, of the State Grid Corporation, says HVDC is the key technology that will help cut 40 to 50 million tons of raw coal consumption per year. This will in turn eliminate around 100 million tons of CO<sub>2</sub> – a contributor to the greenhouse effect.

"The western provinces have large reserves of water resources, like the Yangtze river," she says, "and heavy industry – the demand for power – is in the east."

The link started to transmit power in December 2003, nearly one year ahead of industrial standard. Another HVDC link of the same size between the Three Gorges dam and Guangdong is scheduled for completion later this year. ABB's patented HVDC light technology has won several environmental awards and helped restore power to Long Island after blackouts in 2003.

# Power Technologies

## Utility Automation Systems

**Utility Automation Systems, with its system engineering expertise, is a clear market and technology leader. In 2003, the business area earned around \$1.3 billion in revenues. It has about 5,500 employees, and is focused on automation, control and protection systems for power generation, power transmission and distribution networks, the energy market and water management. Substation automation and protection products, systems and complete utility communication networks round off its utility solution offerings. Europe, the Middle East and the U.S. are key markets, while activities in Asia are expanding.**

### **Power plant automation on the cutting edge**

Intermountain Power Service Corporation (IPSC) wanted “the latest state-of-the-art control systems” for its 1,800 megawatt coal-fired power plant in Utah.

IPSC operates the plant on behalf of 36 municipal and cooperative utilities in Utah and southern California. Almost half the power generated by IPSC is for the Los Angeles Department of Water and Power, the biggest municipal utility in the U.S.

Built in the 1980s, the power plant was in need of a new control system. The existing system was becoming obsolete and spare parts were difficult to obtain.

“We needed to make sure that ten years from now we will still be on the technology cutting edge,” says Bill Morgan, lead project engineer at the plant.

IPSC awarded the contract to ABB for best control system solution, best price and unique application expertise.

The solution – distributed control systems – integrates those aspects of the existing system that IPSC wanted to retain with ABB’s Industrial IT platform – an open architecture that will enable IPSC to remain on the cutting edge for years to come.

### **Energy trading comes of age**

China will use ABB’s energy management technology to increase grid efficiency and, for the first time ever, facilitate regional power trading.

“ABB was selected over other bidders due to its superior technology and delivery record for similar systems,” said Xu Hang, deputy general manager, East China Electrical Power Group Corporation.

In 2003, the Chinese government finalized the priorities of its electricity market. As a result, ABB will install an energy management system at the customer’s network center to supervise and control the power transmission network and optimize operations.

ABB will also install a special market system for regional energy trading in East China to facilitate electricity trading between market participants – including one municipal and four provincial utility companies.

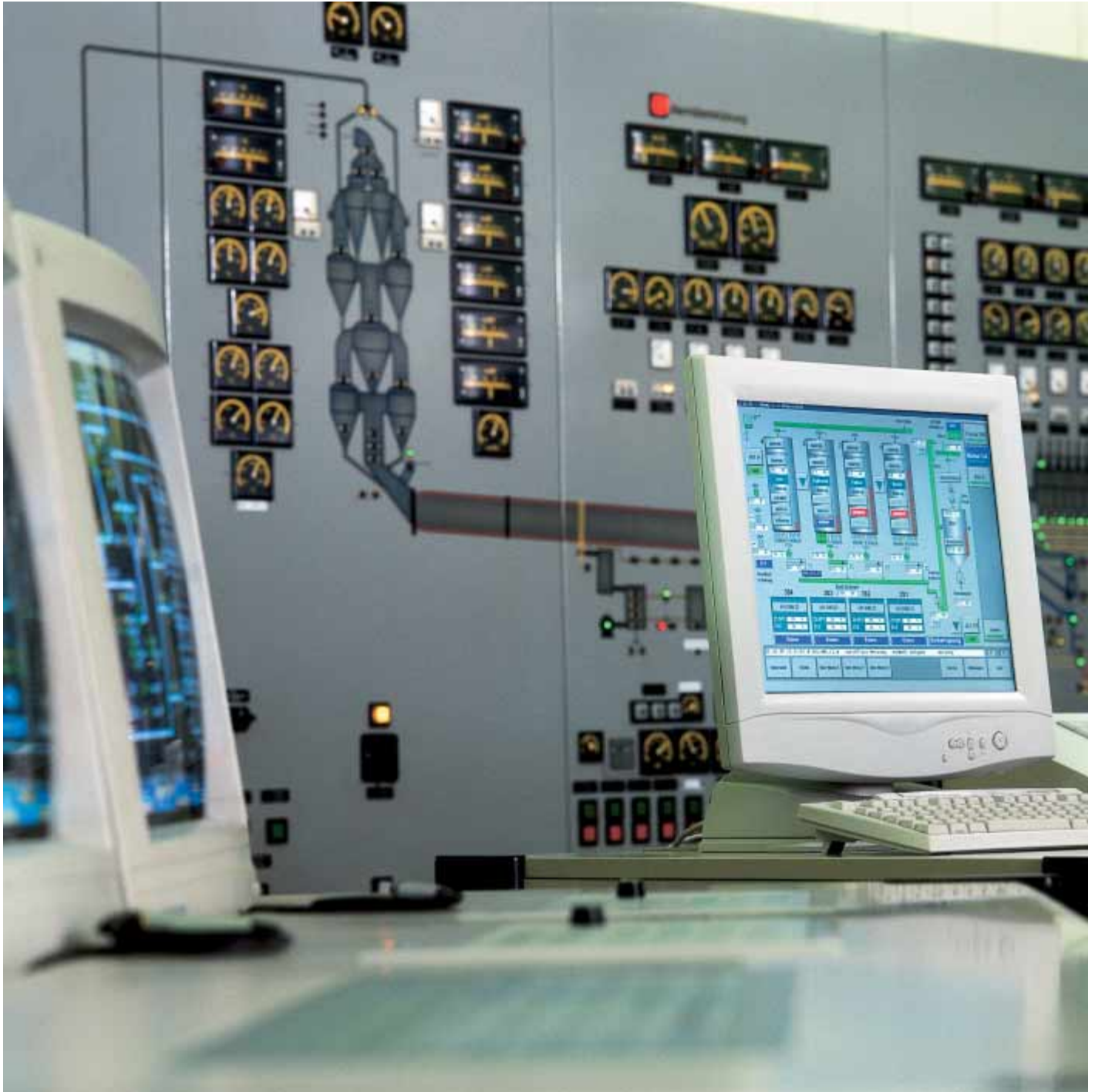
The order shows that energy trading is moving beyond the borders of deregulated markets like the U.S., the Nordic countries and the U.K.



# Automation Technologies

We deliver asset efficiency

Process automation from ABB forms the “nerve center” of complex industrial and utility processes, putting operators in command of variables influencing productivity, quality, safety and environmental performance.





**Dinesh Paliwal**  
Head of ABB's Automation Technologies division  
"We performed well despite challenging markets. We will continue to drive operational excellence while targeting Asia and North America as our high potential markets."

#### Business areas\* and percentage of revenues 2003



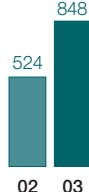
- 1 Low-Voltage Products and Instrumentation **27%**
- 2 Paper, Minerals, Marine and Turbocharging **21%**
- 3 Drives, Motors and Power Electronics **17%**
- 4 Robotics, Automotive and Manufacturing **14%**
- 5 Petroleum, Chemicals and Consumer **14%**
- 6 Control Platform and Enterprise Products **7%**

\* Effective January 1, 2004, ABB merged its six automation business areas into three: Automation Products, Manufacturing Automation and Process Automation.

#### EBIT 2002–2003 (\$ millions)



#### Cash flow from operations (\$ millions)



#### Major orders and contracts

- 1 \$173 million in contracts for gas compressor stations in Poland
- 2 \$135 million service contract with Werk Bobingen in Germany
- 3 \$50 million service contract with Carter Holt Harvey in New Zealand
- 4 \$21 million steel line contract from China's Ningbao Baoxin Group

To find out more visit: [www.abb.com/atd](http://www.abb.com/atd)

**ABB Automation Technologies blends a customer-focused product, service and system portfolio with end-user expertise and global presence to deliver solutions for measurement, control, motion, protection, and plant optimization across a broad range of industrial, utility, and building industry customers.**

The division employs around 55,000 and has some 150 manufacturing, application and software centers worldwide.

#### Performance 2003

Exceeded all financial targets. In local currencies, orders up two percent and revenues up three percent (four percent on a comparable basis). Earnings before interest and taxes (EBIT) up 50 percent in U.S. dollars, EBIT margin up to 7.8 percent from 6.1 percent, and cash flow from operations up 62 percent.

#### Market demand 2003

Continued growth in Eastern Europe, mixed in Western Europe, low in North America (but signs of an upturn), steady in Latin America, strong growth in Asia, the Middle East and Africa.

#### Lowering costs 2003

The Step change productivity improvement program led to \$245 million in savings in 2003 through improvements in personnel costs, overhead, product and site rationalizations and better supply chain management.

#### Strategic priorities 2004

Continue to improve costs and productivity, aggressively push service. Leverage large installed base with targeted product, industry and regional strategies. Broaden strong technology position with customer-focused R&D and new product portfolio.

#### Targets

Revenue growth of 3.3\*\* percent and EBIT margin of 10.7 percent for 2005.

\*\* Compound annual growth rate 2002-2005 excluding major acquisitions, divestments and business closures.

# Automation Technologies

## Process Automation

**The Process Automation business area, formed at the beginning of 2004, employs about 21,500 and had revenues equivalent to about \$4 billion in 2003. It combines the resources of three former business areas: Control Platform and Enterprise Products; Petroleum, Chemical and Consumer; and Paper, Minerals, Marine and Turbocharging.**

**The new business area focuses on solutions for oil and gas, metals and mining, pulp and paper, marine, chemicals and life sciences. Its technologies include a full family of on-line product quality sensors, industry-specific analyzers, process control systems, collaborative production management systems, marine solutions and turbochargers.**

**Largest among these is the design of solutions for control and plant optimization in the process and utility industries, where division personnel apply their extensive knowledge of customer processes to application-specific requirements. Marine sector solutions include propulsion, power generation and distribution, and ventilation. ABB turbochargers add performance, fuel and environmental efficiency to large gasoline and diesel engines.**

**The integration of core measurement and control products and systems with end-user solutions in one business area simplifies the value chain for serving process industry customers. ABB Process Automation is a geographically diverse business, with strategic hubs of activity in the U.S., Europe, India, China, and Southeast Asia.**

### **Extended automation**

So far, automation has been focused on manufacturing assets rather than human assets. This is changing. ABB's new system 800xA extends the scope of automation beyond process control to include all plant automation functions, making them accessible to any user from a single user interface.

One good example: System 800xA allows you to shift from a preventive maintenance scheme to a far more cost-effective predictive maintenance scheme.

You can actually have the system notify the relevant personnel in case of an event that may cause a degradation of the plant's performance. This will allow you to eliminate many unnecessary scheduled checks – for example, 60 percent of all scheduled pressure transmitter interventions indicate no failure – and significantly cut maintenance costs.

Here is how it works: System 800xA includes asset monitors that track the internal conditions of field devices to continuously monitor the status of all assets and identify any events that occur. The system analyzes the severity of the events, notifies the relevant personnel when a limit is reached, and recommends or initiates the appropriate action.

### **The nerve center of an oil platform**

ABB technology is helping to control, supervise and manage one of the most complex and challenging oilfields on the Norwegian shelf.

Norsk Hydro's Grane platform went onstream in October 2003, producing up to 214,000 tons of oil a day. Grane oil is heavy and viscous and reservoir pressure is low, so the oil has to be forced out of the reservoir by pumping natural gas into injection wells from a gas field 50 kilometers away.

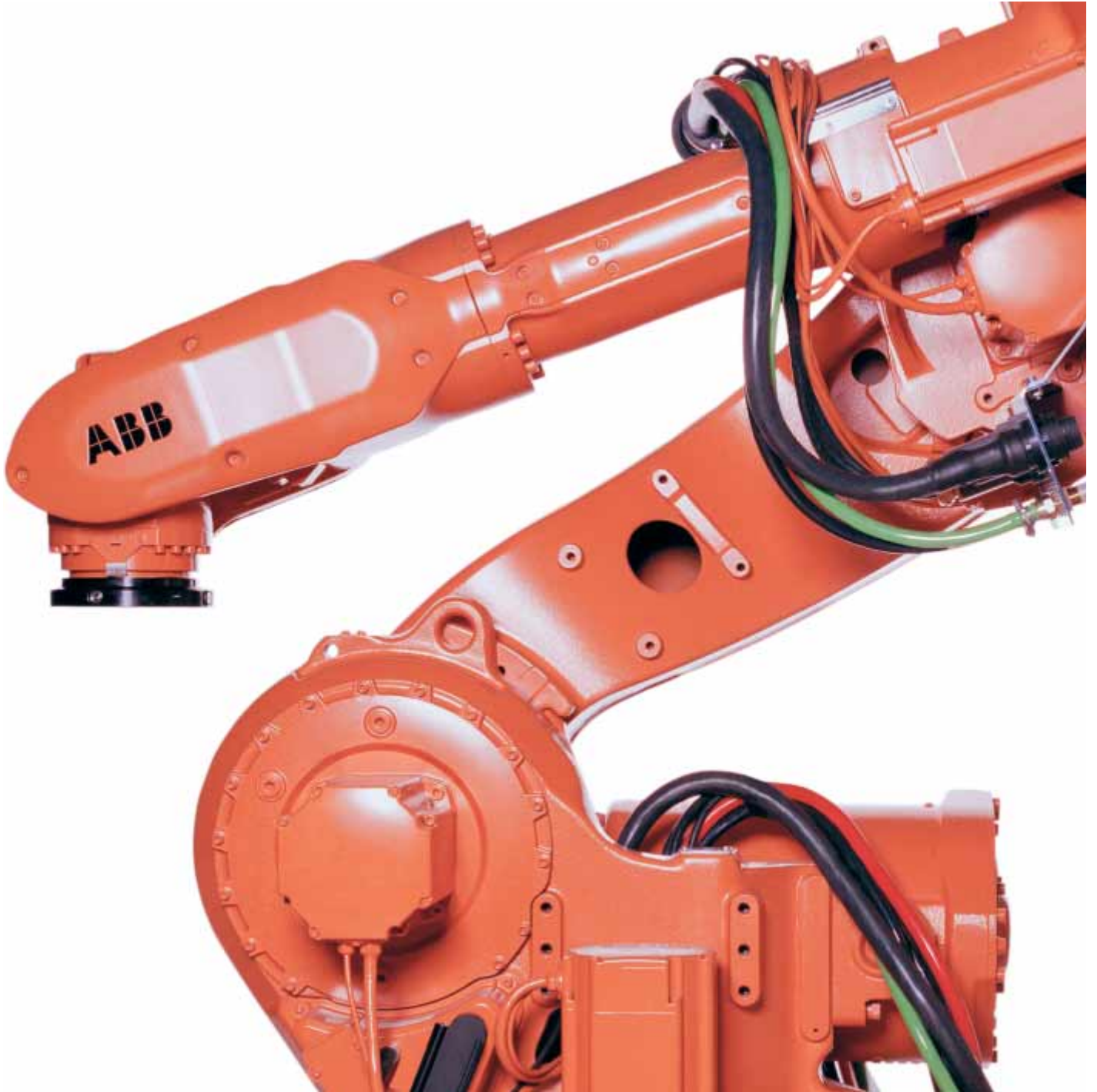
Norsk Hydro spent more than ten years investigating the field and possible recovery methods before it was viable. The nerve center of the platform, and the complex recovery process it houses, is an Industrial IT-based automation system supplied by ABB.

Project execution has been excellent, and the project has been on schedule at all times, says Norsk Hydro of its \$2.3 billion investment in the field.

The ABB system includes control, supervision, safety, emergency shutdown, utility automation, process information management, and an interface with the fire and gas systems.



ABB has sold more robots than any other company – more than 100,000. They paint, weld, cut, finish and package in nearly every industry, from automotive to mobile phones.



# Automation Technologies

## Manufacturing Automation

The Manufacturing Automation business area had revenues of about \$1.4 billion in 2003. It is supported by more than 6,500 employees around the world. ABB has the world's largest installed base of industrial robots – more than 100,000 – and sells robots and related equipment and software to the automotive, material-handling, foundry and packaging industries.

The business area also develops standardized manufacturing cells for machine tending, welding, cutting, painting and finishing. Packaged ABB solutions for press automation, paint process automation and power train assembly are provided to leading automakers.

ABB robots perform operations such as lifting, assembly and finishing with exceptional speed and precision, while protecting human operators from once-hazardous tasks. Although robot capacity has increased dramatically (ABB models maneuver loads greater than 500 kg), the development focus also spans tools for easier programming and faster changeover. ABB software allows configuration and testing of new robot tasks in a “virtual” offline environment, for easy download to production systems.

Manufacturing Automation research and development and manufacturing are focused in the U.S. and Sweden – near major automotive centers. Market coverage is weighted toward the Americas, Western Europe and China.

### Going where no robot has gone before

Automotive assembly and painting have been the traditional home turf of industrial robots for many years. But things are changing. Today, robots are becoming useful and economically viable in a wide range of industry applications. And ABB's new generation of IRB 7600 power robots are leading the way.

The secret lies in the ABB robot's superior strength, with payloads up to 500 kg. Just to compare, ten years ago the world's strongest robot could lift only 200 kg. These developments have attracted many new customers.

Even ABB's design engineers could never have imagined all the possibilities. The IRB 7600 is going where no robot has gone before. From moving bricks to handling windowpanes or steel bars, our customers are discovering new applications all the time.

The IRB 7600 fills a gap that has existed for a long time in many industries: while their existing machines can handle heavy payloads well enough, they lack versatility. Robots, on the other hand, are flexible and precise, but have – so far – simply not been strong enough. Now, the IRB 7600 offers both.

### **Towering over the competition**

ABB finished installing a \$60 million car body assembly line for Volvo in Belgium in 2003.

Tower Automotive Group, a large supplier to the automotive industry, commissioned the order, which included integrating special ABB robots with a control system, software and a wide variety of low-voltage products. Standardized ABB manufacturing cells contributed to on-time and on-budget performance of the complex contract.

Volvo and Tower Automotive Group commended ABB's complete package of products and services. ABB also serves many other so-called Tier-1 automotive suppliers.

For example, Canada's AG Simpson, a major supplier of bumpers to General Motors, Ford and DCX, upgraded its principal bumper stamping line last year with the help of ABB.

### **Saving \$60 million with services in New Zealand**

ABB's service business takes care of customers throughout the whole Automation Technologies division. Across the board, we see that customers increasingly want ABB to help them manage their operations so they can focus on their core businesses. In the last year alone, ABB has won hundreds of millions of dollars worth of these types of service contracts – from the industrial parks of Germany to the national airline of Finland.

For Carter Holt Harvey, a forest products company, ABB won a \$50 million contract to maintain its Kinleith mill in Tokoroa, New Zealand. Our experts say the deal is a perfect example of ABB's service strategy at work.

ABB takes responsibility for all monitoring, troubleshooting, maintenance and equipment upgrades, earning business incentives along the way for lowering environmental impact and improving productivity at the mill.

Carter Holt Harvey expects to save around \$60 million over five years thanks to ABB. "This contract will play an important role in giving the mill a sustainable future," said Peter Springford, CEO of Carter Holt Harvey.

# Automation Technologies

## Automation Products

The Automation Products business area, formed at the beginning of 2004, employs around 27,000 and had revenues equivalent to about \$4.5 billion in 2003. It combines the activities of the former Low-Voltage Products and Instrumentation business area with the Drives, Motors and Power Electronics business area to form an exceptional portfolio of core products.

Key products include low and medium-voltage drives, and low and high-voltage motors, used in building automation, marine, power, transportation, manufacturing and process industries; and power electronics systems, which are sold to metals smelters, railway manufacturers and power plants.

The low-voltage products business includes a wide range of devices for power quality and protection, wire management, switching and motor control. Instrumentation products include actuators and positioners, analytical instruments, plus devices to measure flow, pressure, level, temperature and similar process variables.

Many automation products are sold through channel partners such as distributors, wholesalers, installers, and original equipment manufacturers – providing a strong revenue stream with low project risk. The business area is geographically diverse, with operations and customers throughout Europe, the Americas and Asia.

### Dialing up electricity savings

Motors powering mechanical equipment consume an astounding amount of energy. They account for a full 60 percent of the total electricity consumption in the U.S., for example. And when motors run at a fixed speed, much of the energy used is simply wasted.

Variable speed drives, like ABB's ACS550, precisely control motor speed to reflect actual power demand, eliminating the waste caused by fixed-speed operation and generating end-user savings of up to 70 percent.

The all-new control panel is similar in look, feel and functionality to a mobile phone for user-friendly operation. It features two soft keys, the functions of which change according to the operating state of the panel. A built-in HELP button and a real-time clock assist in set-up and fault diagnostics.

Another ABB innovation creates extra savings by "choking" the effect of harmonics, or electrical disturbances, which cause significant energy loss in devices operating with variable speed drives. Conventional chokes bring down harmonics levels at full load, but do nothing to reduce them at partial load.

With ABB's patent-pending Swinging Choke design, the ACS550 reduces harmonics at both full load and partial load for a total reduction of up to 30 percent compared to traditional choke designs.

ABB drives eliminate around 60 million tons of CO<sub>2</sub> every year.



### **Can you speak my language?**

Whether they're used in a paper machine or a chemical plant, different pieces of equipment are controlled by information passing between them and a control system. The link for this information is called a fieldbus.

The challenge for manufacturers is that different fieldbus devices often speak entirely different languages, depending on the standard communications protocol they use. One might use a protocol called DeviceNet; another Profibus; a third might use the AS-interface protocol. Most devices cannot be interchanged without modification.

ABB has developed a component that bridges this language divide. The Fieldbus Plug (FBP) is a compact accessory that takes information from equipment in the field and converts it to any industry-standard protocol. It is, in effect, a translator or interpreter.

ABB believes the FBP will have significant implications for its low-voltage products business, currently worth some \$2 billion a year.

ABB's fieldbus plug family of products is highly compact, easy to integrate with existing equipment and pretested, simplifying the process of integration across manufacturing plants and considerably reducing costs.

### **Muscular motors for Canadian paper makers**

ABB recently built and supplied a 38 MW motor, said to be the world's largest refiner motor, for Stora Enso's Port Hawkesbury paper mill in Nova Scotia, Canada.

ABB is the world's leading supplier of synchronous motors for pulp refiners, which improve fiber strength and optical properties in paper making. Since the late 1960s, ABB has delivered more than 600 of them for use in mechanical pulp production – the same number as produced by all other suppliers combined.

The 51,000 horsepower motor is designed to drive a primary refiner in a new pulping line at the Port Hawkesbury mill, which makes newsprint and paper for magazines, catalogs and directories.

About 25 percent of ABB's refiner motors are installed in Canada, which is one of the world's largest pulp producers.

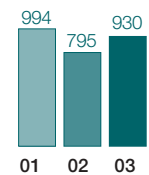
In 1996, ABB delivered eight refiner motors rated 15 and 24 MW for installation on two refiner lines at the mill. Also in 2003, two new 32 MW ABB motors were installed at the primary stage of the existing refiner lines in order to increase pulp production.

# Technology

## Increasing our investment

**“Cutting-edge technology, and our more than 120 years in power and automation, give our core businesses a distinct advantage over our competition,” says Markus Bayegan, ABB’s chief technology officer.**

Investment in technology  
(\$ millions, R&D and  
order-related development)



R&D and order-related development  
in the Oil, Gas and Petrochemicals  
business and other Discontinued  
operations are excluded.

**ABB runs ten corporate  
research programs:**

- 1 Control and optimization
- 2 Software architecture and processes
- 3 Sensors and microsystems
- 4 Power electronics
- 5 Advanced industrial communication
- 6 Mechatronics and robotics automation
- 7 Power device technologies
- 8 Power transmission and distribution applications
- 9 Manufacturing technologies
- 10 Nanotechnologies

New technology safeguards our competitive edge. ABB invested roughly five percent of revenues, or \$930 million, in R&D and order-related development in 2003. That’s an increase of more than \$135 million over 2002.

### Strategy

Our research and development strategy is three-fold.

- Monitor and develop emerging technologies to create a pioneering and sustainable technology base for the company
- Develop technology platforms that enable efficient product design, while serving both power and automation customers
- Develop the next generation of power and automation products and systems to provide the basis for profitable growth

One central task of ABB’s R&D team is to transform university research into industry-ready technology platforms. This concept, honed in recent years, comes to life in more than 50 university partnerships in the U.S., Europe and Asia. Long-term, strategic relationships with Massachusetts Institute of

Technology, Carnegie Mellon University, Stanford University, Cambridge University and Imperial College London underline the importance of this approach.

Our research programs are designed to serve both power and automation customers with products that enable growth and improve profitability. ABB’s core division heads Peter Smits and Dinesh Paliwal sit on the R&D board to ensure technologies meet business needs. Common technology platforms are developed around advanced materials, lean manufacturing, information technology and data communication, as well as sensor and actuator technology. Common applications of basic technologies can also be found in power electronics, electrical insulation and control and optimization.

In power, our insulation technologies, current interruption and limitation, power electronics, flow control and protection of electrical energy, drive everything from large, reliable transmission systems that prevent blackouts to household applications. In automation, our control and optimization, software technologies, power electronics, sensors and microelectronics, mechatronics and wireless communication, improve efficiency at plants and factories around the world – ours included.

### Global laboratories

Group R&D is carried out in two global laboratories for power and automation technologies, combining research units in the U.S., Europe and Asia. The cultural diversity and closeness to ABB’s customers creates a breeding ground for success. In Asia, ABB is building up its R&D activities in India, Singapore and China. This development reflects ABB’s market-specific growth strategy. For example, China is one of ABB’s fastest-growing markets, and needs specific support and local expertise.

 To find out more visit: [www.abb.com/technology](http://www.abb.com/technology)

# 50 groundbreaking ABB technologies



## 01 Multi-phase electrical insulation

The engineering, design and manufacture of solid, liquid and gaseous insulation systems for high, medium and low-voltage applications

## 02 High-voltage current and voltage measurement

A variety of new ways to measure current and voltage in electrical systems, including the transmission of data to related control systems

## 03 Voltage surge arresting

The engineering, design and manufacture of systems that protect electrical equipment from over-voltage, using materials like zinc oxide (ZnO) which have a non-linear response in electrical fields

## 04 Current limiting

A set of technologies to limit the electrical current in a grid including the application of superconductivity

## 05 Current interruption in a vacuum

A package of engineering and manufacturing technologies utilizing new and improved material compositions and electrode design, metal and ceramic bonding and polymeric coatings to build vacuum circuit breakers

## 06 Current interruption in gases

The engineering and manufacture of circuit breakers using techniques to shape special material electrodes and efficiently cool ionized gases, also utilizing thermal management processes, high transient pressure containment, insulating materials and insulation coordination

## 07 Gas insulation technology

Technologies using the physical properties of gases like SF<sub>6</sub> for improved electrical insulation and current interruption in power technology devices

## 08 Contact movement

A set of methods to move mechanical contacts in breakers, disconnectors and switches by applying mechanical, electrical and magnetic forces

## 09 Epoxy technology

Engineering, design and manufacture of epoxy-based casings improving insulation of indoor and outdoor apparatus such as instrument transformers, circuit breakers and bushings

## 10 Switchgear assembly

The engineering, design and manufacture of standardized and customized cabinets and panels for air or gas-insulated power technology devices like circuit breakers, transformers and fuses

## 11 Protection and switchgear control

Applying control and protection principles in an electromagnetically compatible way, for switchgear and substation applications

## 12 Turn-key substations

Engineering, design and construction of air or gas-insulated substations using modular devices and components

## 13 Transformer core technology

Systematic application of knowledge of dynamic magnetic flux in solid materials to engineer, design and manufacture improved transformer cores

## 14 Transformer control

A set of on-line and off-line methods to monitor and control the operation and performance of transformers, including load top changing

## 15 Power transmission technologies

A complete set of technologies to transport electrical energy over very long distances or for local distribution, including overhead lines and cables

## 16 Power semiconductors

Design, engineering and manufacture of power semiconductor devices for power system and industrial applications

## 17 Power electronics

A complete set of hardware, software, methods, and algorithms to control all forms of electrical energy with power semiconductor technology, from drives applications to the management of energy storage

## 18 High-voltage direct current (HVDC)

A combination of thyristor-based converters, power electronic modules, filtering techniques and control systems to provide direct current at high voltage

## 19 HVDC light

The application of high-voltage direct current technology using insulated gate bipolar thyristors and cable technology to extend the range of economic HVDC solutions

## 20 Capacitors

A set of technologies to build compact capacitors up to the highest voltage levels and know-how to integrate them in electrical power installations

## 21 Flexible alternating current transmission systems (FACTS)

A systematic application of power-electronic-based converter technology and wide area control methods that enhance the security, capacity and flexibility of power transmission systems

## 22 AC composite technology

A complete set of methods to engineer, design and build AC systems for a broad portfolio of applications. For example, there are system set-ups that combine substations, transmission and distribution lines, energy storage and control and protection

## 23 Failure protection

Control and protection relays and systems that protect electrical grids from failures at component, subsystem and overall grid levels

## 24 Grid control and optimization

A combination of control and protection technologies, like SCADA, combining wide area control with methods to optimize the safe use and management of the technical and commercial aspects of electrical grids

## 25 Power plant control

The systematic application of computer-model-based control technologies to optimize the operation of power plants from subprocess to complete plant

## 26 Asset management

Design and set-up of information systems to monitor the status of assets in industrial plants as well as utility installations. This includes methods to optimize the sustainable use of the assets by means of predictive maintenance and efficient service

## 27 Industrial IT

A combination of technologies that efficiently manage all interconnected processes in industrial plants. This includes seamless integration of process data from enterprise to shop floor management

## 28 AspectObject technology

The presentation of functionality and features (aspects) of physical objects to enable real-time, secure and reliable data management in industrial applications

## 29 Controller technology

A combination of hardware and software applications that provide redundancy and integrated safety for the real-time control of industrial processes

## 30 Client server technology

An architecture of computer systems that links and embeds objects for process control, based on the proprietary AspectObject technology

## 31 Plant and machine communication

Technologies that efficiently exchange plant data between the field devices controlling and managing production. This includes line, bus and wireless communication

## 32 Process modeling

Graphical design and control module diagrams that provide an efficient, automatic configuration of complex industrial processes

## 33 Paper quality control

A family of technologies for on-line control of the weight, moisture, thickness, color, gloss, smoothness and fiber orientation of paper

## 34 Rolling mill quality control

Application of modeling and simulation techniques to control the thickness of steel products in flat rolling mills

## 35 Control of oil production

A set of algorithms and control technologies using advanced flow modeling techniques to optimize the multiphase flow of liquid, gas bubbles and solid particles at an oil or gas production site

## 36 Plant optimization

Methods to control and optimize the entire industrial production process, from raw material input to delivery, combining both physical and economic parameters

## 37 Drives

A complete set of methods and algorithms to control torque, speed, current, flux and position of motors and generators with the help of power semiconductor technology, creating the most compact drive systems on the market

## 38 Drive systems

Engineering and design of drives into larger systems for applications in paper, metal, petrochemical and other production. Combined with other ABB technologies, drive systems increase productivity and quality in production processes

## 39 Electrical machines

Engineering, design and manufacture of generators and motors for the broadest power range using concepts such as induction, synchronous or permanent magnet applications

## 40 Machine insulation

A set of proprietary impregnation methods and materials to insulate the windings of electrical machines

## 41 Mechatronics

A set of technologies for cinematic and dynamic modeling and drive chain optimization of robots – including their control systems – with real-time applications of algorithms for collision control or collaboration

## 42 Robot application technologies

Fast and easy programming of robotic systems to specific applications in areas like welding, grinding, painting and picking

## 43 Wireless operation of robots

Technologies to transfer control signals and energy supply to moving robot parts without using cable connections

## 44 Sensors

Engineering, design and manufacture of a wide variety of sensors for pressure, flow, temperature, force or other parameters to control industrial processes

## 45 Analytical systems

A variety of methods to determine the chemical composition of goods in industrial processes using chromatography, spectroscopy and other principles

## 46 Low-voltage technology

Engineering, design and manufacture of devices and systems to safely operate low-voltage installations in industrial plants or buildings, including devices like fuses, switches, contactors, breakers or control systems for motors

## 47 Building management technology

A broad spectrum of technologies to improve the use and maintenance of buildings. This includes electrical installations, data management and security systems

## 48 Azipod technology

The application of drives and electrical machines technology in a propulsion system for ships that features high maneuverability

## 49 Turbocharging

Engineering, design and manufacture of a large variety of special compressors to increase the performance of combustion engines

## 50 Force measurement

Equipment to accurately measure flatness, tension, pressure, torque, position and weight of materials, and control industrial processes to improve productivity and quality. It is extensively used in steel and paper making



ABB's leadership in power and automation technologies is based on its ability to systematically manage and apply the knowledge of its global community of scientists and engineers to solve the challenges of its customers. The list inside is a solid technology base developed over decades, on which ABB is continuously building innovative new products and systems.

## 50 groundbreaking ABB technologies

### Human Resources Leadership challenge



**Gary Steel**  
Head of Human Resources  
"A business culture can't evolve simply because you're good at saving money."

**ABB's head of Human Resources Gary Steel addresses cost and staff reductions, leadership development and culture change.**

**Q. Fifteen months ago, ABB promised to reduce annual costs by \$900 million by mid-2004. Will you keep that promise?**

A. Yes, ABB is on target to reduce its cost base by \$900 million annually by mid-2004 under the Step change productivity improvement program. That promise, made in October 2002, has led to more than 1,400 cost reduction projects in ABB at all levels and in every part of the company's operations. For example, we are consolidating suppliers in some areas to manage external spending, and have a program to share ABB people between factories, businesses and countries to reflect the peaks and valleys in our business activities.

**Q. In 2002, ABB had about 146,000 employees. Today, you have 115,000. How are you handling this large reduction in your workforce?**

A. When the Step change program was announced, ABB had about 146,000 employees. The goal was to reduce that number to about 100,000 people by mid-2004, mostly through planned divestments. Around 7,100 positions were eliminated during 2003, largely the result of creating simpler organizational structures.

**Q. How have these changes affected company morale and culture?**

A. People are excited about the future again as ABB recreates itself. There is a new culture, in which cost management is an integral part of every decision made.

However, a business culture can't evolve simply because you're good at saving money. Managing costs must be part of a wider effort to empower and excite people.

Our focus is on individual responsibility and accountability, but also programs to develop leadership, embed business principles, and reward our people. We are building an open culture at ABB, in which people can raise and discuss any issue, and then take action.

**Q. In concrete terms, what actions are you now taking to build the leaders of tomorrow?**

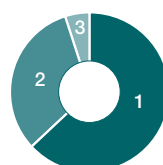
A. The more we value and pay attention to our employees, the better our chances of influencing them in ways that will make ABB healthy, prosperous and competitive.

We have programs which focus on learning, change management and helping people understand the meaning of excellence in their areas of work and expertise.

We have programs identifying and developing internal and external leadership potential at every level, and workshops focused on building leadership and finding innovative ways to leverage ABB's external spending power.

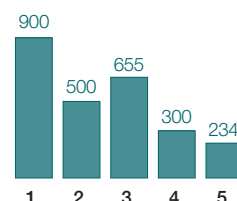
We recognize and reward those who deliver on their promises.

Cost reduction projects and savings (Base: 1,429 projects)



- 1 Projects completed on time or due to be completed ahead of schedule **63%**
- 2 Projects on schedule **32%**
- 3 Projects with one or more actions overdue **5%**

Savings (\$ millions)



- 1 Target savings by mid-2004
- 2 Target year end 2003
- 3 Actual savings 2003
- 4 Target cost 2003
- 5 Actual cost 2003

**Q. What are you doing to improve the working conditions of ABB employees and the communities where they live and work?**

A. ABB has reinforced its health and safety directives (page 35), and is weaving a culture of safety awareness into the fabric of our daily work.

ABB's revamped social policy safeguards the rights and working conditions of employees and enshrines our strong sense of social responsibility.

It also marks ABB's desire to raise the quality of life where we do business by consulting with local communities, and committing to define and participate in projects that benefit them.

And we participate in the U.N. Global Compact and report back on our performance according to the Global Reporting Initiative.

# Sustainability

## An important part of our business

**In 2003 ABB took several bold steps to further integrate sustainability in every aspect of its business. For example, we updated our environmental policy, strengthened our health and safety regulations and implemented a wide variety of measures to ensure our products and systems are geared towards sustainable development.**

We continued to follow the Global Reporting Initiative's triple bottom line, which means we assessed in detail the impact of the economic, environmental and social sides of our business.

Our target is to contribute to long-term economic, environmental and social development, by providing our utility and industry customers with power and automation technologies that improve performance and lower environmental impact.

While it is clear there are still challenges ahead, the bottom line is that sustainability pays. Products and systems that minimize environmental impact sell more readily. Companies that adhere to sustainability rules and principles, independently verified by agencies and organizations, prosper and offer an attractive investment.

Corporate citizenship – which ranges from business principles to community relations – is not only a must, but often a joy to behold, particularly when it benefits those we come into contact with. Joint efforts, such as the Access to Electricity rural electrification project (page 36), or an international human rights initiative in which ABB is a partner, make a real difference.

Sustainable development means continuous improvement. Some areas of focus in 2004: developing a more transparent and safer working culture; increasing cultural diversity; and improving the representation of women in senior positions, as part of our efforts to further sharpen our sustainability focus and foster improvement.

### **Economic: strengthening power supplies**

ABB won the 2003 Platts Global Energy Award for its part in developing the world's most powerful battery storage system in Alaska.

The Battery Energy Storage System has a direct impact on the local economy in Fairbanks. It stabilizes the local grid, and is expected to reduce the number of power outages by 65 percent per year. It provides a practical and environmentally safe solution for a region where an extended outage would be very damaging.

### **Environmental: cutting pollution by 90 percent**

ABB's power and automation technologies helped Stora Enso cut pollution levels by around 90 percent within six months at its pulp and paper plant at Hylte Bruk, Sweden.

ABB's Industrial IT software drives a new wastewater treatment plant, and controls the temperature at which water drawn from the nearby Nissan river is recycled. Another benefit: salmon – virtually extinct 20 years ago – have reappeared downstream in the river.

### **Social: helping children walk again**

Motor stators, supplied free by ABB to a pioneering research team at University College London, are helping children walk again.

The treatment is for children who have lost part of their leg bones through disease or injury. A prosthesis and a small magnetic rotor are implanted in the leg to support the remaining bone.

The rotor is linked to the prosthetic implant by a tiny gearbox and is turned by an external stator. Once placed inside the external stator, a patient's leg can be extended millimeter by millimeter to keep pace with overall growth.

 To find out more visit: [www.abb.com/sustainability](http://www.abb.com/sustainability)



ABB technology forms part of a complex treatment that helps children walk again. It is part of the motor stator seen here, which saves the patient from regular and painful surgery, and reduces hospital costs.





### Highlights

- New nine-point environmental policy
- Group decides to pursue mid-term objective of becoming CO<sub>2</sub> neutral
- Environmental management systems now in place at nearly all sites to ensure continuous improvement of performance
- Further steps taken to reduce use of hazardous waste material

### A new policy to meet growing challenges

ABB introduced a new environmental policy in 2003, strengthening the management of environmental issues relating to our products, sites and customers.

The new policy, which updates ABB's original program introduced in 1992, contains nine commitments to ensure improvements in all parts of the value chain. It means raising standards throughout the life cycle of our products, from suppliers and contractors to when our customers use and recycle the products.

In its latest assessment of ABB's environmental policy, the Sarasin Bank, Switzerland, says: "ABB again scores above the industry average for every aspect of environmental performance." We are an acknowledged industry leader in this field, but changing times and challenges require an updated policy, with a restatement of certain commitments and stronger, more effective guidelines in certain areas.

A key statement in the new policy formally recognizes environmental management as one of our highest business priorities and incorporates sustainability in all our strategies, processes and day-to-day business throughout the group. All ABB units worldwide have to ensure full compliance with environmental laws and take measures to continually lower their environmental impact.

ABB is committed to strengthening environmental management in nine areas

- Ensuring our worldwide operations are conducted in an environmentally sound manner by applying environmental management systems, such as ISO 14001, in all our operations. This also involves applying environmental principles, such as the commitment to continual improvement, legal compliance and awareness training for employees, in all our operations worldwide
- A greater emphasis is being placed on encouraging suppliers, subcontractors and customers to adopt international environmental standards
- More importance to be given to energy and resource efficiency in the development of our manufacturing processes
- Increased audits of our facilities' environmental performance. This also applies to mergers, acquisitions and divestments
- Greater transfer of eco-efficient technologies to developing countries
- Focus more on developing and marketing products and systems which are resource efficient, and facilitate the use of renewable energy sources
- Continue publishing environmental product declarations for our core products based on life cycle assessments
- Include environmental aspects in the risk assessment of major customer projects
- Maintain transparency by producing an annual, independently verified sustainability review, based on GRI requirements

Full implementation is key. Detailed guidelines are being developed for each of the nine commitments to ensure compliance.

### Highlights

- Health and safety measures strengthened
- Seven leading companies, including ABB, launch international initiative to promote human rights in business
- Independent study of 65 top-ranking Chinese and foreign-based companies places ABB in China among top ten employers
- ABB campaigns for HIV/AIDS awareness in South African factories

### Top priority: health and safety

ABB strengthened its social policy, with particular emphasis on health and safety, in 2003.

First, we sharpened our focus on health and safety implementation. Our goal was to ensure that, by the end of 2003, all countries had a clearly defined organization and set of responsibilities for the management of health and safety.

Some of the countries had already met most of these requirements; others had not.

We have been relentlessly training managers while making them accountable and responsible for infractions. We analyzed our own accident and occupational health data, and benchmarked it against other multinationals, to set targets and objectives, which were then implemented.

Monitoring was also strengthened. Our country managers, the most senior managers in each country organization, were given an increased role, and an executive committee-led group from corporate headquarters met, and will continue to meet regularly to ensure full compliance throughout ABB. The group also reviews quarterly reports from all country organizations.

We also continued to develop health and safety skills and capacity within ABB. In 2003 countries were required to appoint a health and safety advisor, and a series of training events were held to help them.

Despite these measures, we regrettably lost 17 people in 2003. Ten died in the workplace, and seven were killed in commuting or business travel-related accidents, including two who died in an air crash. Of the total, 11 were ABB employees, four were contractors and two were members of the public.

This is unacceptable. The goal for 2004 is to eliminate all work-related accidents. We have set a goal for all operations to implement a formal health and safety management system, based on the internationally recognized OHSAS 18001, by the end of 2004.

Beyond these new, more stringent measures, ABB's social policy is designed to improve the quality of life for our employees, their families and people in the communities in which we operate.

Time after time, individuals make the difference. In the United Arab Emirates, for example, our people promote women's employment prospects; in Canada we hold workshops to inspire women to study science and mathematics.

In Germany, ABB volunteers help mentally challenged people in their daily lives. And in Brazil, ABB supports a project to provide destitute children with basic education and future prospects – called "Children with a Future Full of Hope." In countries like Colombia, India and South Africa, ABB is involved in thriving educational projects.

Broader initiatives support these efforts. For example, ABB and six other international companies launched an initiative in December 2003, led by a former president of Ireland and former U.N. human rights commissioner, Mary Robinson, to better define the role of business in human rights.

## Helping economic development in rural Africa

Lights will be turned on for the first time in Ngarambe in southern Tanzania – one of several villages that will benefit from ABB's Access to Electricity initiative to boost economic and social development in Africa.

Underground power lines have been laid. Electrical sockets are installed in newly rebuilt brick walls. And a diesel generator has been delivered to prepare for the flick of a switch when electricity will start to flow. The village government office, health clinic, school and a handful of small shops will jump to life.

Ngarambe – a remote 1,800-strong village located on the edge of a national park – is not linked to a power grid. The area supports itself through hunting and subsistence farming. In weeks to come, the electrification project, carried out in cooperation with the World Wide Fund for Nature, will strengthen the local economy and increase business opportunities.

It is part of ABB's response to the United Nations Global Compact's call for international companies to work with government agencies, financial institutions and non-governmental organizations to grow sustainable business in the world's least-developed countries.

The generator in Ngarambe will provide power in the first phase of the project, but will later be replaced by an ABB-driven wind power installation. Installation is free but consumers will pay for what they use.

The project is the first of a series in Tanzania, some of which will be commercially based. Other ABB rural electrification projects are slated for Senegal and Uganda.

## Measuring our impact in India

ABB in India, a publicly listed company, has about 3,200 employees in eight main manufacturing sites. Orders, revenues and net profit boomed in 2003, and the unit expanded a number of sites.

**Economic:** With orders up 31 percent and revenues up 25 percent in 2003, ABB in India provided a countrywide boost to the local economy. For example, the state-of-the-art factory at Maneja on the rural outskirts of Vadodara employs more than 1,200 people, provides dozens of components suppliers with work and supports local business development. The opening of two plants for distribution transformers and high-voltage motors at Maneja in 2004 is expected to further boost the benefits to the local community.

**Environmental:** Strict implementation of health, safety and environmental standards at factories and offices around the country. Improvement plans range from "adopting" a park in central Bangalore, using rain water to keep a number of factories green, and planting thousands of shrubs and trees to spruce up towns, cities and factories where ABB operates.

**Social:** The company and individual employees are active in a variety of projects. Among them: support and development of a school for underprivileged children in Peenya; training a group of mentally challenged people to work on an industrial production line in Nashik; and rebuilding a school following an earthquake in Gujarat, which has also become a community and skill-learning center.

ABB helps children from underprivileged backgrounds (as seen here in India), in many countries, from Brazil to South Africa and Poland, with devoted programs and extensive volunteer work.



# Corporate governance

## 1. Principle

ABB is committed to the highest international standards of corporate governance, and supports the general principles as set forth in the Swiss Code of Best Practice, as well as those of the capital markets where ABB is listed: the SWX Swiss Exchange and exchanges in London, Stockholm, Frankfurt and New York.

In addition to the provisions of the Swiss Code of Obligations, ABB's principles and rules on corporate governance are laid down in its articles of incorporation, its standards for corporate governance, the charters of the board committees, the board membership guidelines, several directives (e.g. on insider information) and the code on business ethics. It is the duty of ABB's Board of Directors to review and amend or propose amendments to those documents from time to time to reflect the most recent developments and practices, as well as to ensure compliance with applicable laws and regulations.

This section of the annual report is based on the Directive on Information relating to Corporate Governance published by the SWX Swiss Exchange. Where an item listed in the directive is not addressed in this report, it is either inapplicable to, or immaterial for, ABB.

In accordance with the requirements of the New York Stock Exchange ("NYSE"), a comparison as to which extent the corporate governance practices followed by ABB differ from those required under the NYSE listing standards can be found on ABB's Web site under: [www.abb.com/about](http://www.abb.com/about)

## 2. Group structure and shareholders

### 2.1 Group structure

ABB Ltd, Zurich, Switzerland is the ultimate parent company of the ABB Group, which is comprised of around 500 subsidiaries (operating and holding companies) worldwide. Besides ABB Ltd, the only other listed company in the ABB Group is ABB Ltd, India, which is listed on the exchanges in India at Mumbai (BSE and NSE), Ahmadabad, New Delhi and Kolkata.

The following table sets forth, as of December 31, 2003, the name, country of incorporation, ownership interest and share capital of ABB Ltd and its significant subsidiaries:

Company name/Location	Country	ABB interest %	Share capital in 1000	Currency
ABB S.A., Buenos Aires	ARGENTINA	100.00	10,510	ARS
ABB Australia Pty Limited, Sydney	AUSTRALIA	100.00	122,436	AUD
ABB AG, Vienna	AUSTRIA	100.00	15,000	EUR
ABB Ltda., Osasco	BRAZIL	100.00	506,026	BRL
ABB Bulgaria EOOD, Sofia	BULGARIA	100.00	10,400	BGL
ABB Inc., St. Laurent, Quebec	CANADA	100.00	247,157	CAD
ABB (China) Ltd., Beijing	CHINA	100.00	120,000	USD
Asea Brown Boveri Ltda., Bogotá	COLOMBIA	99.99	485,477	COP
ABB Ltd., Zagreb	CROATIA	100.00	2,730	HRK
ABB s.r.o., Prague	CZECH REPUBLIC	100.00	100,100	CZK
ABB A/S, Skovlunde	DENMARK	100.00	241,000	DKK
Asea Brown Boveri S.A., Quito	ECUADOR	96.88	325	USD
Asea Brown Boveri S.A.E., Cairo	EGYPT	100.00	20,040	EGP
ABB AS, Tallinn	ESTONIA	100.00	25,985	EEK
ABB Oy, Helsinki	FINLAND	100.00	168,188	EUR
ABB S.A., Paris La Défense	FRANCE	100.00	38,921	EUR
ABB AG, Mannheim	GERMANY	100.00	167,500	EUR
ABB Automation Products GmbH, Eschborn	GERMANY	100.00	20,750	DEM
ABB Gebäudetechnik AG, Mannheim	GERMANY	100.00	12,315	DEM
ABB Process Industries GmbH, Eschborn	GERMANY	100.00	18,870	EUR
Asea Brown Boveri S.A., Metamorphosis Attica	GREECE	100.00	285,740	GRD



Company name/Location	Country	ABB interest %	Share capital in in 1000	Currency
ABB (Hong Kong) Ltd., Hong Kong	HONG KONG	100.00	20,000	HKD
ABB Engineering Trading and Service Ltd., Budapest	HUNGARY	100.00	114,300	HUF
ABB Ltd., Bangalore	INDIA	52.11	423,817	INR
ABB Ltd, Dublin	IRELAND	100.00	2,871	EUR
ABB Technologies Ltd., Tirat Carmel	ISRAEL	99.99	420	ILS
ABB S.p.A., Milan	ITALY	100.00	22,000	EUR
ABB Sace S.p.A., Milan	ITALY	100.00	60,000	EUR
ABB Trasmissione & Distribuzione S.p.A., Milan	ITALY	100.00	35,000	EUR
ABB Technology SA, Abidjan	IVORY COAST	99.00	178,540	XOF
ABB K.K., Tokyo	JAPAN	100.00	1,000,000	JPY
ABB Ltd., Seoul	KOREA	100.00	18,670,000	KRW
ABB Holdings Sdn. Bhd., Subang Jaya	MALAYSIA	100.00	4,490	MYR
Asea Brown Boveri S.A. De C.V., Tlalnepantla	MEXICO	100.00	419,096	MXN
ABB BV, Rotterdam	NETHERLANDS	100.00	9,076	EUR
ABB Holdings BV, Amsterdam	NETHERLANDS	100.00	119	EUR
Lummus Worldwide Contracting B.V. (LUWOCO), The Hague	NETHERLANDS	100.00	42	NLG
ABB Limited, Auckland	NEW ZEALAND	100.00	34,000	NZD
ABB Holding AS, Billingstad	NORWAY	100.00	800,000	NOK
Asea Brown Boveri S.A., Lima	PERU	99.99	17,152	PEN
Asea Brown Boveri Inc., Paranaque, Metro Manila	PHILIPPINES	100.00	123,180	PHP
ABB Sp. zo.o., Warsaw	POLAND	95.98	208,843	PLN
ABB S.G.P.S. S.A., Amadora	PORTUGAL	100.00	4,117	EUR
Asea Brown Boveri Ltd., Moscow	RUSSIA	100.00	333	USD
ABB Contracting Company Ltd., Riyadh	SAUDI ARABIA	65.00	10,000	SAR
ABB Holdings Pte. Ltd., Singapore	SINGAPORE	100.00	25,597	SGD
ABB Holdings (Pty) Ltd., Sunninghill	SOUTH AFRICA	80.00	4,050	ZAR
Asea Brown Boveri S.A., Madrid	SPAIN	100.00	5,543,595	ESP
ABB AB, Västerås	SWEDEN	100.00	400,000	SEK
Sirius International Försäkrings AB (publ), Stockholm	SWEDEN	100.00	800,000	SEK
ABB Asea Brown Boveri Ltd, Zurich	SWITZERLAND	100.00	2,768,000	CHF
ABB Ltd, Zurich	SWITZERLAND	Parent	5,175,787	CHF
ABB Schweiz Holding AG, Baden	SWITZERLAND	100.00	200,000	CHF
ABB LIMITED, Bangkok	THAILAND	100.00	784,000	THB
ABB Holding A.S., Istanbul	TURKEY	99.95	12,844	USD
ABB Ltd., Kiev	UKRAINE	100.00	500	USD
ABB Industries (L.L.C), Dubai	UNITED ARAB EMIRATES	49.00	5,000	AED
ABB Ltd., London	UNITED KINGDOM	100.00	140,000	GBP
ABB Holdings Inc., Norwalk	UNITED STATES	100.00	2	USD
ABB Inc., Raleigh, NC	UNITED STATES	100.00	1	USD
Asea Brown Boveri Inc., Norwalk, CT	UNITED STATES	100.00	2	USD
Asea Brown Boveri S.A., Caracas	VENEZUELA	100.00	4,899,373	VEB
ABB (Private) Ltd., Harare	ZIMBABWE	100.00	1,000	ZWD

ABB's operational group structure is described in the "Financial review" part of this annual report.

## 2.2 Significant shareholders

As of December 31, 2003, Investor AB, Stockholm, Sweden, informed ABB it held 204,115,142 ABB shares, reflecting 9.86 percent of the company's share capital. The percentage of Investor's share participation had been reduced to this figure from the former 10.01 percent as a result of ABB issuing on December 15, 2003, 30,298,913 new shares out of the authorized share capital in connection with the plan of reorganization of Combustion Engineering (see section 3.2 below).

The Capital Group International, Inc., Los Angeles, CA, U.S., informed ABB that, as of December 31, 2003, they held for their clients 133,888,830 ABB shares, corresponding to 6.5 percent of ABB's total share capital.

To the best of ABB's knowledge, no other shareholder holds five percent or more of ABB's shares.

## 2.3 Cross-shareholdings

There are no cross-shareholdings in excess of five percent of the share capital or the voting rights between ABB and another company.

## 3. Capital structure

### 3.1 Ordinary share capital

As of December 31, 2003, ABB's ordinary share capital (including treasury shares) amounts to CHF 5,175,787,367.50 divided into 2,070,314,947 fully paid registered shares with a par value of CHF 2.50 per share.

### 3.2 Changes to the share capital

At ABB Ltd's annual general meeting held on March 20, 2001, its shareholders approved a share split in a four-for-one ratio to reduce the par value of the shares from CHF 10 each to CHF 2.50 each. Consequently, the number of issued shares changed from 300,002,358 to 1,200,009,432, whereas the share capital remained at CHF 3,000,023,580. The share split was registered in the commercial register on May 7, 2001.

On November 20, 2003, ABB's extraordinary shareholders' meeting resolved to increase ABB's share capital by CHF 2,100,016,505 by issuing 840,006,602 new shares.

Shareholders who did not want to exercise their rights to subscribe for new shares could sell them. 99.4 percent of the rights were exercised. The shares related to unexercised rights were sold in the market and the proceeds were received by ABB.

ABB's new share capital of CHF 5,100,040,085, divided into 2,040,016,034 shares, was registered in the commercial register on December 9, 2003.

Subsequently, ABB issued 30,298,913 shares out of its authorized capital for purposes of fulfilling ABB's obligations under the pre-packaged plan of reorganization of Combustion Engineering. In accordance with its then current articles of incorporation, the pre-emptive rights of the shareholders have been excluded and allocated to an ABB subsidiary, which has subscribed for these shares and holds them until they will be contributed to the Asbestos PI Trust, once the pre-packaged plan of reorganization of Combustion Engineering has become effective (for the accounting treatment of these "Asbestos shares" please refer to Notes 18 and 23 of the "Financial review" part of this annual report).

The new share capital of CHF 5,175,787,367.50 divided into 2,070,314,947 shares was registered in the commercial register on December 15, 2003.

### 3.3 Contingent share capital

ABB's share capital may be increased in an amount not to exceed CHF 550,000,000 through the issuance of up to 220,000,000 fully paid shares with a par value of CHF 2.50 per share (a) up to the amount of CHF 525,000,000 (equivalent to 210,000,000 shares) through the exercise of conversion rights and/or warrants granted in connection with the issuance on national or international capital markets of newly or already issued bonds or other financial market instruments, and (b) up to the amount of CHF 25,000,000 (equivalent to 10,000,000 shares) through the exercise of warrant rights granted to its shareholders. ABB's board of directors may grant warrant rights not taken up by shareholders for other purposes in the interest of ABB.

The pre-emptive rights of the shareholders are excluded in connection with the issuance of convertible or warrant-bearing bonds or other financial market instruments or the grant of warrant rights. The then-current owners of conversion rights and/or warrants will be entitled to subscribe for the new shares. The conditions of the conversion rights and/or warrants will be determined by ABB's board of directors.

The acquisition of shares through the exercise of conversion rights and/or warrants and each subsequent transfer of the shares will be subject to the transfer restrictions of ABB's articles of incorporation (see section 3.5 below).

In connection with the issuance of convertible or warrant-bearing bonds or other financial market instruments, the board of directors is authorized to restrict or deny the advance subscription rights of shareholders if such bonds or other financial market instruments are for the purpose of financing or refinancing the acquisition of an enterprise, parts of an enterprise, participations or new investments or an issuance on national or international capital markets. If the board of directors denies advance subscription rights, the convertible or warrant-bearing bonds or other financial market instruments will be issued at the relevant market conditions and the new shares will be issued pursuant to the relevant market conditions taking into account the share price and/or other comparable instruments having a market price. Conversion rights may be exercised during a maximum ten-year period, and warrants may be exercised during a maximum seven-year period, in each case from the date of the respective issuance. The advance subscription rights of the shareholders may be granted indirectly.

ABB's share capital may be increased by an amount not to exceed CHF 200,000,000 through the issuance of up to 80,000,000 fully paid shares to employees. The pre-emptive and advance subscription rights of ABB's shareholders are excluded. The shares or rights to subscribe for shares will be issued to employees pursuant to one or more regulations to be issued by the board of directors, taking into account performance, functions, levels of responsibility and profitability criteria. ABB may issue shares or subscription rights to employees at a price lower than that quoted on the stock exchange. The acquisition of shares within the context of employee share ownership and each subsequent transfer of the shares will be subject to the transfer restrictions of ABB's articles of incorporation (see section 3.5 below).

#### **3.4 Authorized share capital**

ABB's board of directors is authorized to increase ABB's share capital in an amount not to exceed CHF 174,252,717.50 through the issuance of up to 69,701,087 fully paid shares with a par value of CHF 2.50 per share by not later than May 19, 2005. Increases in partial amounts shall be permitted. The subscription and acquisition of the shares issued under ABB's authorized capital, as well as each subsequent transfer of the shares, will be subject to the transfer restrictions of ABB's articles of incorporation (see section 3.5 below).

The board of directors will determine the issue price, the type of payment, the date of issue of new shares, the conditions for the exercise of pre-emptive rights, and the beginning date for any dividend entitlement. In this regard, the board of directors may issue new shares by means of a firm underwriting through a banking institution, a syndicate or another third party and a subsequent offer of these shares to current shareholders. ABB's board of directors may permit pre-emptive rights that have not been exercised to expire or may place these rights and/or shares as to which pre-emptive rights have been granted but not exercised at market conditions or use them for other purposes in ABB's interest.

The board of directors is further authorized to restrict or deny the pre-emptive rights of the shareholders and to allocate such rights to third parties if the shares are to be used (a) for the acquisition of an enterprise, parts of an enterprise, participations or for new investments, or, in case of a share placement, for the financing or refinancing of such transactions, (b) for the purpose of broadening ABB's shareholder constituency in connection with a listing of shares on domestic or foreign stock exchanges, or (c) for employee participation plans.

#### **3.5 Limitations on transferability of shares and nominee registration**

ABB may decline a registration with voting rights if a shareholder does not declare that it has acquired the shares in its own name and for its own account. If the shareholder refuses to make such declaration, it will be registered as a shareholder without voting rights.

A person failing to expressly declare in its registration application that it holds the shares for its own account (a "Nominee"), will be entered in the share register with voting rights, provided that such Nominee has entered into an agreement with the board of directors concerning its status, and further provided that the Nominee is subject to a recognized bank or financial market supervision. In special cases the board of directors may grant exemptions. There were no exemptions granted in 2003.

#### **3.6 Convertible bonds and warrants**

For additional information about outstanding convertible bonds and options on shares issued by ABB, please refer to Note 15 and 22 of the "Financial review" part of this annual report.

### **4. Shareholders' participation**

#### **4.1 Shareholders' dividend rights**

For shareholders who are residents of Sweden, ABB has established a dividend access facility under which such shareholders have the option to be registered with Värdepapperscentralen VPC AB in Sweden and to receive the dividend in Swedish kronor from ABB Participation AB. For further information on the dividend access facility please refer to the articles of incorporation.

#### **4.2 Shareholders' voting rights**

ABB has one class of shares and each registered share carries one vote at the general meeting. Voting rights may be exercised only after a shareholder has been registered in the share register of ABB as a shareholder with the right to vote, or with Värdepapperscentralen VPC AB in Sweden, which maintains a sub-register of the share register of ABB.

A shareholder may be represented at the general meeting by another shareholder with the right to vote, its legal representative, a corporate body (*Organvertreter*), an independent proxy (*unabhängiger Stimmrechtsvertreter*), or a depositary (*Depotvertreter*). All shares held by one shareholder may be represented by only one representative.

For practical reasons shareholders must be registered in the share register no later than ten days before the general meeting in order to be entitled to vote. Except for the cases described under section 3.5 there are no voting rights restrictions limiting ABB's shareholders rights.

## 4.3 General meeting

Shareholders' resolutions at general meetings are approved with an absolute majority of the votes represented at the meeting, except for those matters described in article 704 of the Swiss Code of Obligations and for resolutions with respect to restrictions on the exercise of the right to vote and the removal of such restrictions, which all require the approval of two-thirds of the votes represented at the meeting.

Shareholders representing shares of a par value of at least CHF 1,000,000 may request items to be included in the agenda of a general meeting. Such request must be made in writing at least 40 days prior to the date of the general meeting and specify the items and the motions of such shareholder(s).

## 5. Board of directors

### 5.1 Responsibilities and organization

The board of directors defines the ultimate direction of the business of ABB and issues the necessary instructions. It determines the organization of the ABB Group and appoints, removes and supervises the persons entrusted with the management and representation of ABB.

The internal organizational structure and the definition of the areas of responsibility of the board of directors, as well as the information and control instruments vis-à-vis the group executive committee, are set forth in the regulations of the board of directors.

Board meetings are convened by the chairman or upon request by a director or the chief executive officer (CEO).

### 5.2 Term and members

The members of the board of directors are elected at the ordinary general meeting of the shareholders for a term of one year; re-election is possible.

ABB's board membership guidelines require that the board of directors is comprised of a substantial majority of independent directors. Currently all board members, with the exception of Jürgen Dormann as chairman and CEO, are non-executive and independent directors (see also below section 5.4).

Members of the board of directors of ABB:

#### Jürgen Dormann

Chairman, president and CEO of ABB, board member since 1998

Chairman of the supervisory board of Aventis (France) and Lion Bioscience (Germany)

Board member: Allianz (Germany)

#### Roger Agnelli

President and CEO of Companhia Vale do Rio Doce (Brazil)

Non-executive board member of ABB, since 2002

Board member: Valepar, Companhia Paulista de Força e Luz, Companhia Siderurgica Nacional, LATASA, VBC Energia, Brasmotor, Mahle Metal Leve, Rio Grande Energia, Serra da Mesa Energia (all Brazil)

#### Louis R. Hughes

Chairman of Maxager Technology (U.S.)

Non-executive board member of ABB, since 2003

Board member: BT Group (U.K.), Electrolux (Sweden) and Sulzer (Switzerland)

Member of the board of advisors of Wavecrest Laboratories (U.S.)

#### Hans Ulrich Märki

General manager of IBM Europe/Middle East/Africa (France)

Non-executive board member of ABB, since 2002

Board member: Mettler Toledo International (Switzerland)

#### Michel de Rosen

Chairman, president and CEO of ViroPharma (U.S.)

Non-executive board member of ABB, since 2002

Board member: Innaphase, Ursinus College, Paul Capital Partners Royalty Fund (all U.S.)

Member of the advisory board of the Global Business Coalition on HIV/AIDS (U.S.)

#### Michael Treschow

Chairman of Ericsson (Sweden)

Non-executive board member of ABB, since 2003

Vice-chairman: Confederation of Swedish Enterprise (Sweden)

Board member: Electrolux (Sweden)

### **Bernd W. Voss**

Member of the supervisory board of Dresdner Bank (Germany)

Non-executive board member of ABB, since 2002

Board member: Allianz Leben, Continental, Quelle, TUI, Wacker Chemie, Osram (all Germany)

### **Jacob Wallenberg**

Chairman of SEB Skandinaviska Enskilda Banken and W Capital Management (both Sweden)

Non-executive board member of ABB, since 1999

Vice-chairman: Investor, Knut and Alice Wallenberg Foundation, Atlas Copco, Electrolux, SAS (all Sweden)

Board member: Confederation of Swedish Enterprise, Nobel Foundation (all Sweden)

Further information on ABB's board members, including details about their education and professional experience, as well as other activities and functions, is available on ABB's Web site under: [www.abb.com/about](http://www.abb.com/about)

### **5.3 Cross-involvement**

Jacob Wallenberg is vice-chairman of Electrolux, where also Louis R. Hughes and Michael Treschow are board members. Jacob Wallenberg, however, will decline re-election at the Electrolux annual general meeting in April 2004.

### **5.4 Business relationships**

This section describes business relationships between ABB and its non-executive board members, or companies and organizations represented by them.

In December 2002, ABB entered into a \$1.5 billion, 364-day revolving credit facility. As of November 1, 2003, the amount available under the facility was reduced to \$1.2 billion. Skandinaviska Enskilda Banken ("SEB") was a lender under this credit facility, with an \$89 million commitment, representing approximately 7.4 percent of the total commitment available to ABB. Jacob Wallenberg is the chairman of SEB. In addition, Dresdner Bank Luxembourg S.A. was a lender under the credit facility, with a \$57 million commitment, representing approximately 4.8 percent of the total commitment available to ABB. Bernd Voss is a member of the supervisory board of Dresdner Bank AG ("Dresdner Bank"). We paid back and cancelled the previous \$1.5 billion secured bank facility. On November 17, 2003, ABB entered into its new \$1 billion credit facility. Each of SEB and Dresdner Bank Luxembourg S.A. has committed to \$83.3 million out of the \$1 billion total.

In June 2003, ABB entered into a ten-year agreement with IBM pursuant to which IBM takes responsibility for the operation and support of information systems infrastructure in 14 countries in Europe and North America, representing approximately 90 percent of ABB's information systems infrastructure. The agreement involves the transfer to IBM of 780 ABB employees, in addition to the 380 employees transferred under pilot programs prior to 2003. The final transfer of responsibilities took place in September 2003. The value of the agreement will approach \$1.7 billion over ten years. Hans Ulrich Märki is general manager of IBM Europe/Middle East/Africa.

During the year 2003 ABB was party to several contracts with Companhia Vale do Rio Doce (CVRD) and its subsidiaries. The largest contracts are for (i) engineering services and supply of equipment of the pelletizing plants located at the port of Tubarao complex (Brazil), with a value of approximately \$6.3 million, and (ii) supply of equipment for the expansion of ALUNORTE (Brazil), with a value of approximately \$6.2 million. There are also various purchase orders for spare parts and machinery in general, amounting to approximately \$1.2 million. Roger Agnelli is president and CEO of CVRD.

ABB's board of directors has determined that these transactions do not constitute material business relationships, comparing the revenues generated from the business described above to the annual revenues of SEB, Dresdner Bank, IBM and CVRD. ABB's board of directors therefore considers Wallenberg, Voss, Märki and Agnelli – as well as the other board members, with the exception of Jürgen Dormann as chairman and CEO – to be independent directors. This determination was made in accordance with the Swiss Code of Best Practice and the independence criteria set forth in the new corporate governance rules of the New York Stock Exchange.

### **5.5 Board committees**

The Board of Directors of ABB has appointed from among its members three board committees: The nomination and compensation committee, the finance and audit committee and the strategy committee. The duties and objectives of the board committees (except for the strategy committee) are set forth in charters issued or approved by the board of directors. These committees assist the board in its tasks and report regularly to the board.



## 5.5.1 Nomination and compensation committee

The nomination and compensation committee determines the selection of candidates for the board of directors and its committees, plans for the succession of directors and ensures that newly elected directors receive the appropriate introduction and orientation, and that all directors receive adequate continuing education and training to fulfill their obligations. The nomination and compensation committee determines the remuneration of the members of the group executive committee.

The nomination and compensation committee comprises three or more independent directors. Upon invitation by the committee's chairman, the CEO or other members of the group executive committee may participate in the committee meetings, provided that any potential conflict of interest is avoided and confidentiality of the discussions is maintained.

Members and secretary of the nomination and compensation committee:

Members: Hans Ulrich Märki (chairman)  
Michel de Rosen  
Jacob Wallenberg  
Secretary: Gary Steel

## 5.5.2 Finance and audit committee

The finance and audit committee oversees the financial reporting processes and accounting practices, evaluates the independence, objectivity and effectiveness of external and internal auditors, reviews audit results and monitors compliance with the laws and regulations governing the preparation of ABB's financial statements and assesses the processes relating to risk management and internal control systems.

The finance and audit committee comprises three or more independent directors who have a thorough understanding of finance and accounting. As determined by the committee's chairman for matters related to their respective functions, the head of internal audit, as well as the external auditors, may participate in the finance and audit committee meetings.

Members and secretary of the finance and audit committee:

Members: Bernd W. Voss (chairman)  
Roger Agnelli  
Jacob Wallenberg  
Secretary: Peter Voser

## 5.5.3 Strategy committee

The strategy committee was constituted on July 28, 2003, after its creation was approved by the board of directors at its meeting of February 10, 2003.

The strategy committee reviews management proposals relating to the strategic direction of the ABB Group and assists the board of directors in determining the long-term strategy of the ABB Group.

Members and secretary of the strategy committee:

Members: Louis R. Hughes (chairman)  
Hans Ulrich Märki  
Michael Treschow  
Secretary: Peter Smits

## 5.6 Meetings and attendance

The table below shows the number of meetings held by the board of directors and its committees, their average duration, as well as the attendance of the individual board members:

	Board of directors	Nomination and compensation committee	Finance and audit committee	Strategy committee
Average duration (hrs.)	6	2.5	3	5
Number of meetings	6	5	9	4*
Meetings attended:				
Jürgen Dormann	6	–	–	–
Roger Agnelli	4	–	6	–
Louis R. Hughes**	4	–	–	4
Hans Ulrich Märki	6	5	–	4
Michel de Rosen	6	5	–	–
Michael Treschow**	3	–	–	4
Bernd W. Voss	5	–	8	–
Jacob Wallenberg	6	5	9	–

\* Most meetings of the strategy committee were also attended by the complete group executive committee.

\*\* Elected as member of the board of directors by the ordinary shareholder's meeting of May 16, 2003. Therefore not able to attend all meetings held in 2003.

## 5.7 Lead director

The board of directors created the position of lead director and appointed Jacob Wallenberg to address potential situations of conflicting interests, which Jürgen Dormann in his dual role as chairman of the board and CEO may experience.

The additional tasks of the lead director are to act as counselor to the chairman and facilitate the dialogue between the members of the board and the chairman. He may call special meetings without the chairman's presence where the chairman's role and performance will be discussed.

The position of lead director will cease to exist upon separating the chairman of the board and CEO positions.

## 5.8 Board compensation

For the period from the annual general meeting of shareholders in 2003 to the annual general meeting of the shareholders in 2004, the compensation of the board of directors was kept at the previous year's level, which is:

■ Chairman:	CHF 1,000,000
■ Member:	CHF 250,000
■ Committee chairman:	CHF 50,000
■ Committee member:	CHF 20,000

Payments to board members are made in May and November in advance of each term. Board members receive at least 50 percent (and may elect to receive a higher ratio) of their net compensation, i.e. after deduction of social security costs and withholding tax (where applicable), in ABB shares, which they are entitled to receive with a discount of ten percent of the average share price during a 30-day reference period. During the term of the board membership, the ABB shares are kept in a blocked account and may only be disposed of after the respective person has left the board of directors.

In 2003, the current board members received the following compensation (the calculation of the number of shares and the cash amount varies depending whether the respective person is subject to taxation at source):

	Total annual compensation (gross), in CHF	Amount received in cash (net) in CHF	Number of shares received
Jürgen Dormann*	1,000,000	0	155,948
Roger Agnelli	270,000	0	41,629
Louis R. Hughes	300,000	103,863	23,153
Hans Ulrich Märki	320,000	0	67,833
Michel de Rosen	270,000	93,371	20,814
Michael Treschow	270,000	93,371	20,814
Bernd W. Voss	300,000	0	46,307
Jacob Wallenberg	290,000	0	44,748
Total	3,020,000	290,605	421,246

\* Jürgen Dormann received this compensation in addition to his compensation as CEO (see section 6.4 below).

With the exception of Jürgen Dormann in his function as CEO, board members do not receive pension benefits and are not eligible to participate in ABB's management incentive program.

No compensation was paid to former board members.

## 5.9 Ownership of ABB shares and options

The table below shows the number of ABB shares, or equivalent U.S. american depositary shares (ADS), held by each board member as of December 31, 2003:

	Number of shares
Jürgen Dormann	580,415
Roger Agnelli	70,613
Louis R. Hughes	36,656
Hans Ulrich Märki	195,577
Michel de Rosen	55,028
Michael Treschow	38,083
Bernd W. Voss	106,138
Jacob Wallenberg	94,329

With the exception of Jürgen Dormann in his function as CEO none of the board members holds any options in ABB shares. No person closely linked to any of the board members holds any shares of ABB or options in ABB shares. As persons closely linked are understood in this context: 1) The spouse; 2) children below the age of 18; 3) legal or natural persons acting as fiduciary; or 4) legal entities controlled by a board member.

## 5.10 Secretary to the board of directors

John G. Scriven is secretary to the board of directors. He succeeded Beat Hess after the 2003 annual general meeting of shareholders.

## 6. Group executive committee

### 6.1 Responsibilities and organization

The board of directors has delegated the executive management of ABB to the CEO and the other members of the group executive committee. The CEO, and under his direction the other members of the group executive committee, are responsible for ABB's overall business and affairs and the day-to-day management. The CEO reports to the board regularly, and whenever extraordinary circumstances so require, on the course of ABB's business and financial performance and on all organizational and personnel matters, transactions and other issues relevant to the group.

Upon proposal by the nomination and compensation committee, the group executive committee is appointed and discharged by the board and consists of the CEO, the chief financial officer (CFO) and the other executive vice presidents.

## 6.2 Members

### Jürgen Dormann

President, CEO and chairman of the board

### Dinesh Paliwal

Executive vice president

Automation Technologies

### Peter Smits

Executive vice president

Power Technologies

### Gary Steel

Executive vice president

Human Resources

### Peter Voser

Executive vice president

CFO

Further information on ABB's group executive committee, including details about education and professional experience, as well as other activities and functions, is available on ABB's Web site under: [www.abb.com/about](http://www.abb.com/about)

## 6.3 Management contracts

There are no management contracts between ABB and companies or natural persons not belonging to the ABB Group.

## 6.4 Group executive committee compensation

Members of the group executive committee receive annual base compensation. In addition, they are eligible for annual bonus compensation, which depends on the performance of the individual area of responsibility of each group executive committee member and of the ABB Group and, in certain cases, on a qualitative appreciation of a member's achievements.

In addition to receiving annual base and bonus compensation, members of the group executive committee may participate in a management incentive program. Under this program approximately 1,100 key employees received warrants and warrant appreciation rights for no consideration over the course of six launches (plus one special launch in 1999) from 1998 to 2003. The warrants are exercisable for shares at a predetermined price, not less than the fair market value as of the date of grant. Participants may also sell the warrants rather than exercise the right to purchase shares. Equivalent warrants are listed on the SWX Swiss Exchange, which facilitates valuation and transferability of warrants granted under the management incentive plan.

All members of the group executive committee participated in the sixth launch of ABB's management incentive program. Each of them received 1,000,000 warrants or equivalent warrant appreciation rights (for details refer to section 6.6 below). None of the members of the group executive committee has received ABB shares as compensation, except for Jürgen Dormann in his function as chairman of the board (see section 5.8 above).

Group executive committee members receive customary additional benefits such as a company car and health insurance compensation, which are not material in the aggregate.

In applying the “cash-out principle” the table below shows the gross payments that were made to the members of the group executive committee, which include the bonuses that are based on 2002 business performance, as well as the employer’s part of the ordinary pension contributions. All members of the group executive committee are insured in the ABB Pension Fund, the ABB Supplementary Insurance Plan and the Tödi foundation (the regulations are available under [www.abbvorsorge.ch](http://www.abbvorsorge.ch)), with the exception of Dinesh Paliwal, who is insured under the U.S. pension plan (see footnote below).

	Currency	Salary paid in 2003	Bonus 2002 received	Additional compensation	Total annual compensation	Employer's pension contributions
Jürgen Dormann*	CHF	3,235,000	0	0	3,235,000	1,286,864
Dinesh Paliwal**	USD	550,000	404,250	0	954,250	345,911
Peter Smits	CHF	825,000	567,000	0	1,392,000	219,157
Gary Steel***	CHF	600,000	0	660,300	1,260,300	143,694
Peter Voser	CHF	700,000	700,000	0	1,400,000	145,824
Total****	CHF	6,097,000	1,808,695	660,300	8,565,995	2,259,060

\* This compensation as CEO is in addition to the compensation received as chairman of the board.

\*\* As Dinesh Paliwal has a U.S. employment contract he received his salary in U.S. dollars. His pension contributions are based on the U.S. pension plan.

\*\*\* Gary Steel received the amount of CHF 660,300 as compensation for shares and options due to change of employment.

\*\*\*\* For the purpose of calculating the total, the U.S. dollar amounts relating to Dinesh Paliwal have been converted into CHF at an average conversion rate of 1.34.

## 6.5 Performance alignment

For 2003, ABB introduced a structure for aligning the performance expectations of its senior managers.

Group executive committee members, corporate staff and country managers of the 19 largest countries receive targets and are measured on ABB Group results, rather than on the basis of individual businesses. Business area managers and local country divisional managers receive targets and are measured on ABB Group results (60 percent) and on their business area or divisional results (40 percent).

At least 20 percent of this “scorecard” must be made up of qualitative measurements, such as order growth with key customers, performance appraisal systems and financial gearing.

In addition to this group of senior managers, all other participating managers are measured with a minimum of 25 percent on ABB Group results. Resulting bonuses are paid in March each year after full-year results are announced.

In applying the scorecard principles, group executive committee members have a maximum bonus opportunity of 100 percent of their base salary.

## 6.6 Ownership of ABB shares and options

Under ABB's management incentive program members of the group executive committee received options in the years 1998 to 2003. The details of the various launches are as follows:

MIP launch	Allotment year	Vesting period	Term life	Subscription ratio	Exercise price CHF
MIP 1	1998	3 years	6 years	1.54:1.26	24.51
MIP 2	1998	3 years	6 years	1.54:1.26	20.26
MIP special	1999	3 years	6 years	5:1.26	29.75
MIP 3	1999	3 years	6 years	5:1.26	32.73
MIP 4	2000	3 years	6 years	5:1.26	42.05
MIP 5	2001	3 years	6 years	5:1.26	13.49
MIP 6	2003	3 years	6 years	5:1	7.00

The subscription ratios and exercise prices of MIP 1 to MIP 5 were adjusted due to the increase of ABB's share capital in December 2003 (see section 3.2 above).

As of December 31, 2003, the members of the group executive committee held (which does not necessarily equal the numbers granted, if the vesting period has lapsed) the following numbers of shares and options (based on the categorization described above):

							Number of options	
		Allotment year 1998 (MIP 1)	Allotment year 1998 (MIP 2)	Allotment year 1999 (MIP special)	Allotment year 1999 (MIP 3)	Allotment year 2000 (MIP 4)	Allotment year 2001 (MIP 5)	Allotment year 2003 (MIP 6)
Jürgen Dormann*		0	0	0	0	0	0	1,000,000
Dinesh Paliwal	119,500	0	30,000	0	100,000	250,000	1,000,000	1,000,000
Peter Smits	51,000	0	0	0	100,000	250,000	1,000,000	1,000,000
Gary Steel	0	0	0	0	0	0	0	1,000,000
Peter Voser	17,000	0	0	0	0	0	1,000,000	1,000,000

\* For Jürgen Dormann's share ownership see section 5.9.

No person closely linked to any member of the group executive committee holds any shares of ABB or options in ABB shares.

## 7. Loans and guarantees granted to ABB's board of directors or group executive committee

ABB has not granted any loans or guarantees to its board members or members of the group executive committee.

## 8. Compensation for former members of the group executive committee

In 2003, ABB made a total payment of CHF 5,191,616 gross to four members of the group executive committee who departed during the calendar year 2002. This figure is composed of salary payments during contractual notice periods and severance payments made in lieu of continuing salary payments. In addition, ABB made contributions to the respective pension funds in an aggregate amount of CHF 321,886. In January 2004, ABB made a payment of CHF 589,592 gross to one former member of the group executive committee, in fulfillment of a contractual pension commitment.

## 9. Duty to make a public tender offer

ABB's articles of incorporation do not contain any provisions raising the threshold (opting-up) or waiving (opting-out) the duty to make a public tender offer pursuant to article 32 of the Swiss Stock Exchange and Securities Trading Act.

## 10. Change of control provisions

ABB does not offer "golden parachutes" to its members of the board of directors or senior executives. Consequently none of ABB's board members, group executive committee members or members of senior management is benefiting from clauses on changes of control. Employment contracts normally contain notice periods of 12 months for group executive committee members and three to six months for members of senior management, during which they are entitled to running salaries and bonuses.



## 11. Auditors

### 11.1 Group auditors and special auditors

Ernst & Young is the group and statutory auditor of ABB. OBT has been elected as special auditor to issue special review reports required in connection with capital increases.

### 11.2 Duration of the mandate and term of office of the group auditor

Ernst & Young assumed the existing auditing mandate as auditor of the ABB Group in 1994. The head auditor responsible for the mandate, Charles Barone, began serving in this function in May 2003.

### 11.3 Auditing and additional fees paid to group auditor

The audit fees paid by ABB in 2003 to Ernst & Young for the legally prescribed audit amounted to \$21 million. Audit services are defined as the standard audit work performed each fiscal year necessary to allow the auditor to issue an opinion on the consolidated financial statements of ABB and to issue an opinion on the local statutory financial statements.

It also includes services that can only be provided by the group auditor such as assistance with the application of new accounting policies, preissuance reviews of quarterly financial results and comfort letters delivered to underwriters in connection with debt and equity offerings.

In addition, ABB paid \$13 million to Ernst & Young for non-audit services performed during 2003. Non-audit services include primarily accounting consultations and audits in connection with divestments, audits of pension and benefit plans, accounting advisory services, tax and compliance and other tax services. In accordance with the requirements of the U.S. Sarbanes-Oxley Act and rules issued by the Securities and Exchange Commission ("SEC"), the finance and audit committee has, on a global basis, introduced a process for the review and pre-approval of audit and non-audit services to be performed by the auditors.

### 11.4 Supervisory and control instruments vis-à-vis the group auditors

Ernst & Young periodically reads the approved minutes of meetings of our board of directors. Ernst & Young is present at the finance and audit committee meetings where audit planning is discussed and the results of our internal audit department's audit procedures are presented. Ernst & Young also periodically meets with the finance and audit committee to discuss the results of its audit procedures.

## 12. Information policy

ABB reports to the SWX Swiss Exchange and the exchanges in London, Stockholm, Frankfurt and New York, where it is listed, and publishes quarterly reports. ABB submits its annual report on form 20-F to the U.S. stock exchange supervision authority, the SEC. All of these reports may also be downloaded from: [www.abb.com/investorrelations](http://www.abb.com/investorrelations)

The company's official means of communication is the Swiss Official Gazette of Commerce.

Inquiries may also be made to ABB Investor Relations:

Telephone: +41 43 317 71 11

Fax: +41 1 311 98 17

ABB's Web site is [www.abb.com](http://www.abb.com)

## 13. Further information on corporate governance

The list below contains references to additional information on the corporate governance of ABB, which can be accessed at: [www.abb.com](http://www.abb.com)

- articles of incorporation
- regulations of the board of directors
- CV of members of the board of directors
- CV of members of the group executive committee
- corporate governance charter
- charter of the nomination and compensation committee
- charter of the finance and audit committee
- business ethics
- comparison of ABB's corporate governance practices to the New York Stock Exchange rules

## Division management teams

### Automation Technologies

Division head	Dinesh Paliwal
CFO	Herbert Parker

#### Business area managers:

Automation Products	Tom Sjökvist
Manufacturing Automation	Bo Elisson
Process Automation	Martinus Brandal

Local division manager, China	Veli-Matti Reinikkala
Country manager, Finland	Mikko Niinivaara
Country manager, Germany	Bernhard Jucker
Country manager, India	Ravi Uppal
Country manager, Ireland	Frank Duggan
Country manager, Sweden	Sten Jakobsson

#### Division function managers:

Communications	Brad Hoffman
Human Resources	Jeff Halsey
Information Systems	Haider Rashid
Operational Excellence	Anders Jonsson
Strategic Marketing	Girish Nadkarni
Technology	Peter Terwiesch

### Group Functions reporting to CEO, Jürgen Dormann

Corporate Communications	Björn Edlund
Corporate Strategy	Tobias Becker
Group Internal Audit	Markus Kistler
Legal Affairs and Compliance	John Scriven
Research and Development	Markus Bayegan

### Group Functions reporting to head of Human Resources, Gary Steel

HR Operations	Paul Lewis
Executive Remuneration	Jimmy Yap
Sustainability Affairs	Christian Kornevall

### Power Technologies

Division head	Peter Smits
CFO	Victor Bolt

#### Business area managers:

High-Voltage Products	Jens Birgersson
Medium-Voltage Products	Guido Traversa
Power Systems	Josef A. Dürr
Transformers	Brice Koch
Utility Automation Systems	Michael Hirth

Country manager, Canada and local division manager, United States	Paul Kefalas
Local division manager, China	Peter Leupp
Local division manager, Germany	Joachim Schneider
Local division manager, Sweden	Per Haugland
Local division manager, Switzerland	Hanspeter Fässler

#### Division function managers:

Communications	Klaus Treichel
Human Resources	Ulla Jonsson
Information Systems	Wes Patterson
Marketing	Jasmin Staiblin
Project Management	Jim Triompo
Quality	Steven Hegyi
Technology	Georg Schett

### Group Functions reporting to CFO, Peter Voser

Corporate Finance and Taxes	Alfred Storck
Finance Advisory	Johan Löwenhielm
Group Controlling	Hannu Kasi
Information Systems	Haider Rashid
Investor Relations	Michel Gerber
Merger and Acquisitions and New Ventures	Eric Elzvik
Risk Management	Charles Salek

### ABB Lummus Global\*

CEO	Samir Brikho
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\* Also reporting to CFO, Peter Voser

## Country managers

### Europe

Austria	Rudolf Petsche
Baltic States	Bo Henriksson
Benelux	Marco Croon
Czech Republic	Olle Jarleborg
Denmark	Claus Madsen
Finland	Mikko Niinivaara
France	Allan Huldt
Germany	Bernhard Jucker
Greece	Costas Cosmadakis
Hungary	Peter Hegedus
Ireland	Frank Duggan
Italy	Gian-Francesco Imperiali
Norway	Peer-Hakon Jensen
Poland	Mirosław Gryszka
Portugal	Carlos Dias
Romania	Peter Simon
Russia	Michel Tchesnakoff
Slovak Republic	Andrej Toth
Spain	Carlos Marcos
Sweden	Sten Jakobsson
Switzerland	Hanspeter Fässler
Turkey	Oivind Lund
United Kingdom	Trevor Gregory

### Middle East and Africa

Egypt	Bassim Youssef
Iran	Homayoon Bayegan
Israel	Ronen Aharon
Kenya/Eastern Africa	Martin De Grijp
Morocco/North and Francophone Africa	Jean-Claude Lanzi
Nigeria/Western Africa	Paul Mair
Saudi Arabia	Mahmoud Shaban
South Africa/Southern Africa	Carlos Pone
UAE/Near East and Gulf	Faraj AlJarba

### Americas

Argentina	Ulises de la Orden
Brazil	Joakim Olsson
Canada	Paul Kefalas
Chile	Victor Ballivian
Colombia	Ramon Monras
Mexico	Armando Basave
Panama/Central America, Caribbean	Alvaro Malveiro
Peru	Eduardo Soldano
United States	Dinesh Paliwal
Venezuela	Carmine Tedino

### Asia

Australia	John Gaskell
China	Peter Leupp
India	Ravi Uppal
Indonesia	Ulf Rolander
Japan	Isamu Suzuki
Malaysia	Bengt Andersson
New Zealand	John Gaskell
Philippines	Magnus Wibling
Singapore	BoonKiat Sim
South Korea	Yun-Sok Han
Taiwan	Göran Sundin
Thailand	Jonny Axelsson
Vietnam	Erik Rydgren

### Region managers

Central and Eastern Europe	Bruno Berggren
North and South East Asia	BoonKiat Sim
Middle East and North Africa	Faraj AlJarba
Sub Sahara Africa	Carlos Pone

Our Web site serves every stakeholder group, from customers (60 percent of traffic) and suppliers to NGOs, journalists, investors, potential employees and academics.



**ABB had around 12 million visitors to its Web site in 2003.**

## About ABB

This section of the site provides an overview of our products, services and solutions, sheds light on the ABB Group strategy, and outlines our organizational structure, business principles, corporate governance charter and 120-year history.

## Products and services

ABB's products and services are its lifeblood. In this section you can find our product guide – an A to Z list of products we have made or now make. You can also find our service guide and contact list, which provide detailed information regarding the upkeep of power plants and factories, and sales contacts to help you get what you need immediately, wherever you are located.

## Sustainability

ABB follows the Sustainability Reporting Guidelines, first published in mid-2000 by the Global Reporting Initiative (GRI) – an international, multi-stakeholder undertaking supported by the United Nations. The GRI guidelines are based on a “triple bottom line” reporting concept, covering economic, environmental and social performance.

## News center

This section is devoted to the media and includes press releases, trade and technology releases, speeches and presentations, downloadable pictures of our people and technology, and an up-to-date library of publications.

## Technology

ABB is a technology-based company. We run two global research and development labs and ten research programs in power and automation. You can watch streaming video interviews with our experts and listen to them discuss strategy and the future direction of R&D. One of the most valuable parts of ABB's technology section is devoted to publications, including research papers, periodicals, technology reviews and reports.

## Careers

The careers section on ABB's Web site offers everything you need to know as a student, recruit or professional looking for new challenges. It features the most recently posted jobs in ABB, background information on the company, and interviews and videos-on-demand with existing employees. New sections are devoted to registering your own CV, and students and interns, where you can choose from a variety of interesting international assignments.

## Investor relations

This section includes ABB's share price ticker, listings and ticker symbols. It displays per share, dividend and stock split history and has all of ABB's quarterly financial releases, an information archive, outlook statement, annual reports and shareholder updates.



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