

There's not a major city in the world that can ignore the risks lurking in an unstable, unreliable supply of electricity, not least the fast-growing city of Shanghai. Modern power technology is currently bringing light to millions of Chinese. The power failure that recently plunged much of North America and Europe into darkness could potentially have been avoided with the same technology.

In this issue: 50 years of HVDC technology – its origins, breakthrough innovations and milestone projects. Also, our most recent HVDC project – superhighways carrying power from the Three Gorges dam site to China's industrial and population centers. Other technologies used in modern electrical grids are also described, like FACTS, wide area monitoring and power semiconductors. And we look at real-time energy performance management, plus a unique tool that simplifies the generation and retrieval of documentation.



## ABB's leadership in power technology: the result of long-term investment in R&D



Today's world of business is subject to constant change, and the pace is quickening. Fast response under good leadership is therefore essential. Certain aspects of business, however, still call for the long-term view, rewarding those with perseverance and the ability to stay the course. R&D is one of these. Envisioning future needs, acquiring special skills, developing and testing prototypes; there are no short cuts when introducing new products or systems to the marketplace.

ABB is the undisputed leader in power transmission, but this position has had to be earned. Years of high investment in goal-oriented R&D programs were necessary. In this issue of ABB Review we share with you some of the most recent results of our R&D in this area – state of the art technologies which, in the coming years, will help significantly to shape the industry's future.

High-voltage direct current (HVDC) transmission is a case in point. Having developed this technology for long-distance bulk power transmission half

a century ago, ABB is today still the leader in HVDC transmission, with one new world record after the other. An HVDC link we recently installed at the Three Gorges power plant in China is able to handle as much as 3300 MW of electrical power!

ABB's HVDC Light™ technology is another unique achievement. The high level of voltage stability it provides increases grid reliability and supports network restoration – two strengths being utilized at Cross Sound in the USA, where HVDC Light is used to link Long Island with Connecticut.

Wide area monitoring and control, combined with a whole range of sophisticated FACTS (Flexible AC Transmission Systems) devices, such as static var compensators and series capacitors, is another area in which our R&D is boosting grid reliability and stability while increasing power flow. Here, simulation tools play a vital role by identifying bottlenecks and spotting possibilities for network expansion (see also ABB Review 1/2003). Such technology is vitally necessary if the recent massive power outages that occurred in North America and Europe are to be avoided in the future.

ABB is also active in helping electricity users reduce their consumption without compromising on quality or production levels. An article in this issue looks at how real-time energy performance management can help industry optimize its energy efficiency.

State of the art technology of the type mentioned above is just one

side of the story. Equally important is how responsive we are to our customers' needs. Speed and cost-effectiveness are crucial. Over the past few years we have started up factories for our products that combine proprietary manufacturing know-how with advanced automation systems, run and controlled by the very latest information technology – our own IndustrialIT. These factories are interfaced to high-performance engineering tools, enabling us to provide tailor-made solutions of the highest standard for our customers in the shortest possible time.

We are convinced that ABB power technologies, of which the above-mentioned are just a few, will play a major role in shaping the future of the world's power industry. This will apply in regions, like Asia, where considerable additional power is required to develop industries and improve living standards, just as much as it does in countries where the reliability and quality of the power supply needs to be significantly improved by upgrading the existing infrastructure.

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