According to a popular story, Christopher Columbus made an egg stand on its end by tapping it gently on the table. This tale is often used to illustrate how effective solutions can remain elusive until approached from a fresh angle.

This “thinking outside the box” (or eggshell?) is the essence of innovation. In this end-of-year edition, *ABB Review* presents a selection of the successes that the company’s research labs have hatched this year. Welcome to the *World of Innovation*!

Obliged to the tradition of innovation

Successful technology innovation is based on three fundamental capabilities: to know what customers want, to provide the cutting-edge technology to satisfy their needs, and together with them develop ideas for future applications.

Driving innovation along these three lines is a century-old tradition at ABB, as old as the company itself. ABB has a history of ingenious inventors pushing technology forward, beginning with the development of generators 100 years ago, distribution and transmission with high voltage DC and drives technology in the 1950s, and control and automation technologies in line with the computer boom since the seventies.

Because significant inventive steps involve cross-fertilization between areas that have no obvious link, ABB's broad technology base in energy and automation is a perfect breeding ground for fostering a plenitude of innovation. Our seven research programs cover the whole technology spectrum of the company, and the technologies developed within that frame are used throughout all divisions.

In this issue of *ABB Review* we invite you to learn about innovative steps taken in 2007. The examples we have chosen are representative of many more in all our business applications.

The consequent application of information and communication technologies in a traditional area of hardware components, such as circuit breakers and transformers and other equipment in a substation, is a prominent example of merging know-how from very different technical disciplines. With our innovative tools for design, engineering and testing, we have brought a new class of higher service and engineering performance to substations based on the IEC 61850 standard. Customers benefit from faster delivery and higher operational flexibility as well the greater ease of interoperability.

We applied the know-how of heat transfer with heat pipes to the generator circuit breaker – the breaker type holding the world record in breaking capacity – and extended its application range by 20 percent, an impressive step in a technological field generally considered mature.

Spillover effects between industries are also drivers of innovation. With the application of multi-variable model predictive control – which is well established in the petrochemical industry – to utility power plants, we made great strides in increasing efficiency and reducing emissions.

Transmission of electrical power with direct current is a technology whose ability to meet global challenges is increasingly being recognized. Energy savings on long transmission lines is a burning issue in China and other countries with high energy needs and long distances between the power generation sites and the large consuming urban centers. Ultra voltage levels of 800 kV DC are now available to transport several gigawatts of power.

Remote service is another field of innovation with high customer satisfaction. Here the effective application of information and communication technologies is instrumental and we are proud to have pioneered major steps for remote service in almost all of our business applications.

While even three-year-old children are agile enough to put puzzle pieces together, robots, known to us as robust and powerful machines, have had difficulties with such tasks for a long time. Now, with the help of force control, they can operate with the precision of a watchmaker and even develop a "feeling" for delicate fine-motoric movement. This force control opens up many new applications for robots throughout the whole industry, with significant cost savings and product quality enhancement for customers.

Our continuous stream of innovations is the outcome of thousands of inventive engineers and researchers working in ABB's development and research teams around the world. These innovators assess customers' problems and needs, and, as part of a global team, apply their multi-disciplined talents to the creation of solutions, helping customers to see new opportunities in their own innovation processes.

These strong innovation dynamics are a traditional strength at ABB. It is also a tradition of *ABB Review* to present the innovations we are especially proud of in the year-end issue. We hope you feel the pioneering spirit that moved the people behind these innovations and become inspired yourself.

Enjoy your reading.

Peter Terwiesch
Chief Technology Officer
ABB Ltd.