

Breakthrough technology



Prith Banerjee

Dear Reader,

Switches are the essence of virtually every electrical or electronic system. Ranging from the integrated logics of microprocessors in control systems to the massive breakers that control the grid, switching devices underpin almost all of ABB's activities, and indeed technology in general. ABB is continuously seeking to push the envelope of switching capability and thus enable new applications. In many cases this may be about advancing the limits of existing applications. Occasionally entirely new and disruptive "game-changing" breakthroughs redefine the market. The hybrid DC breaker is very much in the latter category.

ABB has for decades been a pioneer of high-voltage DC (HVDC), permitting the transmission of power at low losses over long distances and with high controllability. Moving beyond individual standalone transmission lines, the company believes the backbone of tomorrow's power grid will be an HVDC network. Similarly to AC, a DC grid requires breakers – for example, to be able to isolate individual sections safely in the event of a disturbance without shutting down the entire system. There are, however, significant differences between interrupting AC and DC that cannot be overcome by scaling or adapting existing AC solutions. ABB has overcome these challenges with a hybrid breaker – hybrid because it uses both conventional switching technology and semiconductors. This technology has recently been recognized by the MIT Technology Review as one of top 10 innovations of 2012. The hybrid breaker is the topic of the lead article of this edition of *ABB Review*.

While on the topic of switches, this edition presents a variety of other switching articles, spanning different applications and power ranges – from high-voltage AC to motor control, and even ABB's new semiconductor device: the BIGT, one of whose applications is in the above hybrid breaker. Continuing

with the topic of switching and its applications, a history article looks back on the company's 100 year involvement in power electronics. The focus is mainly on the switching devices themselves. A discussion of the applications is planned for an upcoming issue.

Moving onto other topics, this issue of *ABB Review* has a subsection on mining, presenting a selection of ABB's contributions in this field. Further articles from across the board of the company's activities look at heavy-lifting vessels, data centers, the simulation of large plants and maintenance planning.

But it is not just electrical current that is being switched. Starting with this issue, some changes are coming over this journal itself. Readers in languages other than English may notice its name has changed to *ABB Review*, creating a uniform identity and recognition across all languages used. Another novelty for those who read the journal in electronic form is an email alert being launched to ensure they never miss an issue (see inside-back cover to sign up). Further changes will be announced in upcoming issues. Despite this development in form and presentation, *ABB Review* remains committed to its high standards of content.

Finally, as my tenure as chief technology officer at ABB comes to an end, I would like to say goodbye to all readers, trusting that you will continue to follow the company's technology advancements through *ABB Review*.

Enjoy your reading!



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