

## Our Challenge for Reliable Power Supply through Cooperation with Global Partners



Takashi Ikeguchi

*CTO*

*Power Systems Company*

*Hitachi, Ltd.*

BECAUSE electric power is an important part of the social infrastructure that supports industry and living standards, providing a reliable power supply is a major challenge for all nations that are continuing to experience economic growth, especially Japan, which is working urgently to recover from the Great East Japan Earthquake.

In collaboration with partners from around the world, Hitachi is making a global contribution through the development of leading-edge technologies to satisfy the following objectives:

- Establish, maintain, and improve the reliability of those electric power systems that form part of the social infrastructure.
- Conserve resources by improving efficiency.
- Reduce the environmental burden.

Although Hitachi Works and other production facilities and buildings located in Ibaraki Prefecture suffered major damage in the recent disaster, they were quickly back in operation. During that difficult time, we received many messages of encouragement and offers of support from our friends around the world. We would like to take this opportunity to express our thanks for your kind assistance.

This issue starts by focusing on technologies for electric power distribution. In this sector the global market is exhibiting a growing demand for distribution capabilities such as long-distance transmission and power system stabilization. In this technotalk, staff from the new Transmission & Distribution Systems Division (established in April of this year) discuss the current state of electric power distribution technology and its future outlook.

Examples of Hitachi's increasingly global power system business are also provided in this issue, and we examine Hitachi's experience of supplying a large thermal power plant in Southeast Asia and our international R&D (research and development) program in Europe related to large coal-fired power plants. Other articles look at new initiatives for improving generation efficiency and for using energy effectively. These include AHATs (advanced humid air turbines) able to achieve similar efficiency to a combined cycle plant despite using only a gas turbine, and trigeneration systems that recover the waste heat from a gas turbine to produce fresh water.

To improve the reliability of power generation systems and thus help ensure a steady supply of electric power, this issue summarizes Hitachi's latest numerical simulation techniques based on CFD (computational fluid dynamics), SCADA (supervisory control and data acquisition) systems for generation equipment and the systems that coordinate their operation over a wide geographical area, and the next-generation protection and control equipment for maintaining the safe operation of the power system in the event of lightning strikes or other incidents.

In the field of renewable energy, this issue contains an article describing example installations of a large downwind turbine generation system and the technologies used for its interconnection with the grid. Another article highlights the use of CFD to optimize a water turbine runner shape such that it makes better use of hydraulic energy.

I hope that these articles will help to inform you about the electric power and energy sectors, including Hitachi's involvement and the outlook for this technology.