

## Special Issue

# “Strengthening the Services and Solutions Business and Responding to the Shift to EVs and Automotive Electrification.”



Executive Officer, CTO (Chief Technical Officer)  
**Masaki EGAMI**

Against the backdrop of global warming and climate change issues, global efforts to achieve net-zero greenhouse gas emissions, or carbon neutrality, are gaining pace. **NTN** is committed to contributing to the realization of a carbon-neutral society. We are promoting research and development with a focus on our material issues of realizing a sustainable society powered by natural energy and of reducing energy loss. We also have advanced CAE technology, which aids us as we design our products and study technologies. CAE enhances the reliability of our products and our ability to make proposals to our customers. In this issue, we feature our efforts in the areas of (1) Service and Solution Related Technologies, (2) EV and Electrification-Ready Technologies, and (3) Evaluation and Analysis Techniques. We also introduce three of our new products and six products and technologies that have received external awards.

In Special Feature 1, we introduce technologies and products that contribute to the spread of wind power generation and help improve the productivity of operating equipment. The use of wind power generation systems is expanding globally. Key tasks are to ensure their stable operation and to curb power generation costs. **NTN** has contributed to the stable operation of wind power generation equipment and reduction of operating costs by providing Wind Doctor™. This monitoring service remotely collects and monitors vibration and other data from wind power generation equipment and notifies customers of anomalies and changes, thereby reducing the need for operation management and maintenance. We have also developed technologies and products that contribute to the stable operation of equipment and improved productivity, such as rolling bearings with built-in sensors, including Talking Bearings™, portable vibroscopes, and bearing diagnostics applications compatible with the Edgexcross™ IoT platform. We will introduce these technologies and products here.

In Special Feature 2, we introduce our technologies and products for bearings, hub bearings, and constant velocity joints for automotive electrification. The pursuit of carbon neutrality is driving a rapid shift toward automotive electrification. A key task in this is to stretch the cruising range of EVs. This in turn calls for smaller and more efficient onboard components, including key components such as those used in e-Axles. **NTN** has been contributing to the reduction of energy loss in vehicles by bringing new products to the market that deliver smaller sizes and greater efficiency in bearings, hub bearings, and constant velocity joints. We have also been developing highly functional and efficient modular products that take advantage of our core technologies in tribology, mechanical design, and mechatronics, such as electric ball screw units, electric oil pumps, and the Ra-sHUB™, a hub bearing with a steering mechanism. We will introduce these technologies and products here.

Special Feature 3 introduces Evaluation and Analysis Techniques that use CAE for rolling bearing design and bearing operating life estimation. Proposing, in a timely manner, competitive products aligned to market trends and customer needs calls for greater sophistication and higher efficiency in product design work and product performance evaluation. This paper introduces a newly developed integrated technical calculation system for rolling bearings and a CAE calculation system that semi-automates the design process of hub bearings. In addition, we introduce analysis technology that enables reliable bearing design under conditions where oil film formation is insufficient. This technology addresses the shift toward lower viscosity lubricants which stems from the demand for more efficient machines.

We hope that our technologies and products introduced in this issue will help bring about a carbon-neutral society. Guided by our corporate philosophy “For New Technology Network: Connecting the world through new technologies”, we shall contribute to international society through creating new technologies and developing new products. We will work toward the further development of industry, while coexisting with nature, through research and development activities centered on carbon neutrality.