[Preface]

– Introduction to this Special Feature Issue –

To the new issue featuring elemental technologies

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Global warming, currently occurring on this 4.6 billion years old earth, is a very critical issue to be addressed by the modern society that has been enjoying economical growth thanks to the consumption of fossil energies. Since the Industrial Revolution in Great Britain, much carbon dioxide (CO_2) has been emitted as a result of the combustion of petroleum and coal. In the past 200 years, the carbon dioxide concentration in the atmosphere has increased by as much as 25%, and now the entire earth is, so to speak, situated in a greenhouse.

In this situation, **NTN** has remained committed to global environment conservation as its most important challenge not only in its production activities but also in its R&D activities. In the industrial machinery field, we are committed to the development of bearing technologies for natural energy utilizing equipment such as wind power generation plants and for next-generation transportation equipment while “modal shift” is in progress. We are promoting product development activities to help realize low fuel consumption and electrification in the car industry. We are attempting to more strenuously cultivate and expand “elemental technologies” that constitute the basis for these technologies. More specifically, we are committed to new R&D efforts that include use of bioplastic materials, use of novel materials which can reduce use of rare metals, eco-friendly heat treatment techniques, research into nano-structure level metal materials, surface generation for higher mechanical strength and lower friction, and use of higher-polymer gel (a next-generation material) for decreased friction, as well as development of more sophisticated analysis techniques.

For distribution at JIMTOF 2008 (24th Japan International Machine Tool Fair) held October 30 to November 4, 2008, we published the Japanese language version of **NTN** TECHNICAL REVIEW No.76 (2008) featuring topics about **NTN**’s latest elemental technologies that support engineering aspects of eco-friendly products boasting compact size, light weight, lower running torque (lower friction) and longer service life. This issue begins with a contribution titled “Industry-University Partnerships in R&D of Machine Elements” written by Yoshitsugu KIMURA, Professor Emeritus, The University of Tokyo and Kagawa University, a world’s authority in the field of tribology. This topic is followed by presentations of our recent new technologies and developments for new products such as elemental technologies including those for improving wear resistance by surface generation and advanced sensor technologies applied in the medical field; industrial machinery products and precision equipment products such as wind power generator bearings; and “Development and Commercialization of Minimum Quantity and Cooling Jet (MQCJ) Lubrication Angular Ball Bearings for Machine Tool Spindles” which won the 2007 Engineering Award from The Japan Society for Precision Engineering.

Since the beginning of its research and manufacturing of ball bearings in 1918 at the then Kuwana-cho, Kuwana-gun (present-day Kuwana City, Mie Prefecture, Japan), **NTN** has been attempting for 90 years to develop new products always aiming at “realization of quality that can satisfy customers’ needs”. Strictly adhering to our philosophy “For New Technology Network - We contribute to the international society through creation of new technologies and development of new products”, we will further remain committed to promote, based on the achievements obtained through more strenuous cultivation of our elemental technologies, our R&D activities to satisfy requirements for the ecology, safety and comfort from a global standpoint, thereby we will contribute to society.