



Newsletter on the  
Latest Technologies  
Developed by RTRI

Railway Technical Research Institute  
2-8-38 Hikari-cho, Kokubunji-shi  
Tokyo 185-8540, JAPAN  
URL: <http://www.rtri.or.jp>

Editorial Office: Ken-yusha, Inc.  
URL: <http://www.kenf.or.jp/en/>

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# Railway Technology Avalanche

December 18, 2009 No.29

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## Keywords are "Safety" and "Ecology"

**Hideyuki TAKAI**

Director, Research & Development Promotion Division

The Railway Technical Research Institute (RTRI) is conducting research and development (R&D) across the whole field of technology relating to railways, such as vehicles, structures, power supply, signalling and human sciences. In recent years, we have adopted "Safety" and "Ecology" as keywords common to each technical field. "Safety" is the most important factor in railways and the principal objective of R&D work at RTRI. Among other issues, derailments are a phenomenon inherent in railways, and R&D to prevent derailments is promoted as part of the programme of work in each technical field. The greatest challenge to prevent derailments occurring is elucidation of the tribology phenomenon that acts between the wheel and rail, and we are making every effort to elucidate the mechanism of derailments by combining theories, indoor experiments and experiments in the field. In terms of R&D relating to vehicles, we are aiming at developing a bogie that will exert only small changes in wheel load on the track by improving the ability of the bogie to follow the twist of the track. This bogie will also exert only a small lateral force thanks to improvement in its turning properties during passage through a curve. In the recent past, R&D relating to the other keyword "Ecology" has focused mainly on reducing the impact on the wayside environment caused by the noises and vibration that accompany the increase in the speed of a train. However, in recent years, global warming caused by the increasing emission of greenhouse gases, such as carbon dioxide, has actually happened and railways are supposed to have an advantage in this aspect but are also expected to make further efforts. As specific



themes for R&D, mention is made of life cycle assessment (LCA), technical development that takes recyclability into consideration, improvement in the efficiency of drive systems, regenerative power technology, development of fuel cell vehicles, etc.

From the high-speed rail technology that originated in Japan and is now spreading across Europe and the rest of the world, to the intensive commuter transport that supports urban activities, we will continue to make efforts so that railways can contribute to the continuous development of social/economic activities as a very safe and environmentally-friendly mode of transportation.

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Hideyuki Takai