



Newsletter on the
Latest Technologies
Developed by RTRI

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RTRI's Promotion of Research and Development in Recent Years

Ikuo WATANABE

Director, Research & Development Promotion Division

RTRI is now promoting research and development based on its Master plan for research policies, RESEARCH 2010, covering the period from 2010 through 2014. Research targets adopted include the improvement of railway safety and convenience, harmony with the environment and cost reduction in view of recent railway accidents/disasters and the current severe economic circumstances.

(1) Improvement of railway safety

Railways place the highest priority on safety. Therefore, RTRI is promoting a number of research projects to prevent natural disasters caused by earthquakes or strong winds and ensure the safety of passengers and rolling stock in operation as well as other measures to guarantee the safety of railways.

RTRI has developed a technique to estimate earthquake disasters at high precision using an algorithm to reflect the vibration amplifying characteristics of the ground. This is based on the perennial micro-vibration data in addition to that obtained with seismographs installed on the ground. RTRI also has developed a technique to extract the risk of the reduction of earthquake resistance of individual sections along the route, with structures represented by simplified models.

(2) Harmony with the environment

Research is under way to save energy and evaluate the effect of noise, vibration and electromagnetic fields generated by railways on the wayside environment and passenger car compartments. The research also includes determining measures to reduce the detrimental effect of these nuisances. RTRI has already developed high-efficiency induction motors to reduce losses by about 30% in medium and high-speed ranges.

(3) Cost reduction

To cut the operating costs, RTRI is promoting research projects to improve the efficiency of maintenance work and methods for designing and construction work. RTRI has already completed an image processing program to evaluate the occurrence of cracks in tunnels.

(4) Improvement of convenience for customers

To improve the convenience of railways, RTRI has developed



technologies to raise the train speeds of Shinkansen and narrow-gauge lines and also to improve transport services as a whole. Furthermore, RTRI is developing a linear motor type rail brake technology and a technique to predict passenger flows when transport has been disturbed.

(5) Construction of simulators railway engineering

RTRI is making efforts to develop models to analyze the high-frequency vibration and interaction between wheel and rail at their contact point in detail and improve simulation technologies to analyze the motion of railway cars after derailment.

In view of the aftermath of the Pacific Off-Shore Earthquake (Magnitude 9.0) that hit the Tohoku Area in March 2011, RTRI will also set/promote new themes in the future to predict the magnitudes of tsunamis after very large earthquakes.

渡辺 郁夫