



Newsletter on the
Latest Technologies
Developed by RTRI

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Recent Research and Development by RTRI

Atsushi ICHIKAWA

Vice President, Railway Technical Research Institute

The Railway Technical Research Institute (RTRI) has four priority objectives for research and development – “improvement of safety,” “harmony with the environment,” “cost reduction” and “improvement of convenience.” To effectively pursue these objectives, RTRI has adopted three research categories - “basic research for railways,” “development of practical technologies” and “research and development for the future of railways.” In this context, RTRI has adopted important subjects to be addressed on a preferential basis. These subjects deal with the changes in recent years in the environment surrounding railways. For this purpose, researchers are promoting research for 250 to 300 themes every year, of which the most emphatically being promoted in recent years are research and development to a) upgrade simulation technologies, b) address natural disasters that are becoming increasingly extensive in scale and c) develop better energy saving technologies. These are summarized below.

• Enhancement of simulation technologies

To develop new technologies, railways have historically attached importance to various tests and measurements in laboratories, in the field and on test tracks. However, the remarkable progress of computer technologies in recent years has resulted in a number of simulation technologies to supplement these tests and measurements. As a source of innovation for railway technologies, RTRI is making efforts to upgrade simulation technologies by developing a comprehensive simulator to reproduce various behaviors in a wide variety of railway environments and conditions.

• Research and development to mitigate natural disasters

It is apparent that natural disasters, such as rainfalls, strong winds or earthquakes that hit Japan are steadily becoming more hostile year after year and are leaving destructive scars behind. As an example, the number of places where rainfall exceeds 80 mm per hour or 400 mm per day has approximately doubled

in 30 years. Thus, while RTRI was promoting various research and development activities based on a concept to “prevent damage,” the emphasis has now been redirected slightly for research and development to “minimize damage,” given the natural disasters at unprecedentedly gigantic scales in recent years.

• Research and development of energy saving technologies

The Tohoku Region Pacific Coast Earthquake (in 2011) destroyed a nuclear power station (in Fukushima Prefecture). This accident thrust the issue of saving energy before Japan as a subject of utmost importance. Whereas the railway industry has an unrivaled high efficiency of energy consumption, railways are now required to further improve the efficiency of energy utilization. Under the circumstances, RTRI will promote the following activities in the near future. Namely, RTRI will:

- Propose technologies to enable a 20% increase in the efficiency of energy utilization by 2030.
- Establish a technique to quantitatively assess the volume of energy consumed in different fields of the railway system.
- Collect, analyze and transmit the information on energy saving technologies.



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