Newsletter on the Latest Technologies Developed by RTRI

Railway Technology Avalanche

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"Incredible" and "Inevitable" Events

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On March 11, 2011, a great earthquake and tsumani struck the Tohoku district, a north-eastern part of Japan, destroying hundreds of towns and claiming 28,000 lives.

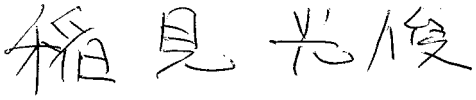
If accidents and disasters are classified into "inevitable" and "incredible" events, the earthquake that occurred in the off-shore area of the Sanriku district was an "inevitable" event, as earthquakes have frequently occurred in that area. However, its magnitude of M9 was certainly an "incredible" figure. The subsequent tsunamis represented an "inevitable" event, as some towns had constructed 10 m-high seawalls to prepare for such tsunamis. Nevertheless, the fact that the tsunamis were far higher than that was an "incredible" event.

At the Fukushima Nuclear Power Plant No.1, the nuclear reactors were subject to an emergency shut down when the earthquake occurred. This was an "inevitable" event at the initial stage, which turned into an "incredible" event, however, when subsequent tsunamis completely deprived the plant of power and reactor cooling capabilities. It is anticipated that it will take a long time for normal operations to be completely restored at the power plant.

Railways and other social infrastructures have to be constructed and maintained on the assumption that they are subject to earthquakes at some time in the future. This is believed to be the fate of the Japanese archipelago as it rests on earthquake nests. Although all conceivable countermeasures were taken as far as possible against earthquakes, "incredible" events have taken place every time that an earthquake has occurred, causing serious damage and loss of invaluable human lives. If people do not forget "incredible" events that have happened and utilize them as a valuable lesson, however, even an "incredible" event will turn out to be "inevitable", and "inevitable" events will be prevented with human efforts and wisdom.

For the Shinkansen railway that has been designed to withstand earthquakes since its inauguration in 1964, the railway operators are carrying out work to reinforce the structures and make the railway more earthquake-resistant based on lessons learnt from the Great Hanshin-Awaji Earthquake disaster that seriously damaged the high speed railway network in 1995. Thanks to these precautionary measures, no passengers were injured or killed when the Mid Niigata Prefecture Earthquake occurred in 2004, though few cars of the train was derailed. The railway operators have been introducing a high-performance emergency stop system and other measures to prevent moving trains derailing or leaving the track. As a matter of fact, all the trains in service stopped safely when the East Japan earthquake occurred on March 11 this year. This is a case where "incredible" disasters were prevented, based on the lessons learnt from "inevitable" disasters.

Along the Tohoku Shinkansen line, a number of ground facilities were damaged by the Earthquake. However, the total route was restored to the original state on April 29, with trains now running on this important transport artery to contribute to the restoration of the Tohoku district.



On April 1, 2011, the Railway Technical Research Institute (RTRI), a juridical foundation, became a public interest corporation authorized by the Prime Minister.
At this juncture, RTRI proclaims its intention to further enrich its research activities, thereby aiming at contributing to the development of railways, science and culture of the country. Your unchanged support and encouragement from now on will be highly appreciated.