Development of Earthquake Disaster Simulator for Railways
Hiroki MOTOYAMA, Kimitoshi SAKAI, Jun IZAWA, Yoshitaka MURONO

We have developed an earthquake disaster simulator for railways to assess seismic performance of the structure group continuously existing in a long section of the railway line. The purpose of this simulator is to evaluate the wave propagation from the fault to the bedrock, the seismic responses of subsurface ground and the structure group on the track. The simulator has automatic modeling functions using the data obtained from each archive (faults/ground/structures), seismic response analysis functions and resultant visualization functions. Here, the development of the simulator and its calculation examples are shown.

Study on Application of Radar Rainfall to Operation Control of Railways
Hiroto SUZUKI, Ryoji OSHIMA

When the East Japan Railway Company (hereinafter called “JR East”) detects heavy rain by using rain gauges installed in approximately 10 km intervals, JR East enforces the train operation control for securing safety. These rain gauges can detect heavy rain that occurs in any area along the railways. However, on the contrary, there are cases when these rain gauges cannot detect localized heavy rain. Therefore, we are developing a train operation control method by using the radar rainfall. This method can detect heavy rain that cannot be detected by the rain gauges.

Development and Installation of Wireless Sensor for Railway Electrification Infrastructure Monitoring
Hidetoshi KISHI

The Research & Development Center of JR East Group has jointly developed with Hitachi Ltd. a system for railway electrification infrastructure monitoring that is configured by a wireless sensor and reader. With this system, measurement data of the sensors attached along the railway can be efficiently collected by the readers mounted to trains driven at a maximum speed of 130 km/hr. This system has been already installed to some areas within the Joban Line, and data collection and analysis for achievement of CBM (Condition Based Maintenance) of the DC feeder wire have been started.

Degradation of Power Semiconductor Modules in Railway Vehicles
Tenko FUKUDA

Failure of power semiconductors used in devices such as traction converters may have an adverse effect on vehicle operation. In order to address this problem, researches on quantitative estimates of aged degradation have been conducted to obtain basic data used for maintenance and renewal of the devices. Degradation estimation was conducted on two IGBT modules, which have different ages of service. The thermal resistance of IGBT modules was a determinant of their product lifespans. Degradation of the modules' internal materials caused thermal resistance to increase, so we investigated the degradation sites and weak points in the modules.

Distribution of Open Data Including Train Locations and Schedules
Hitoshi KAMIYA, Tomoyuki KAWARAI

For its 10th anniversary, Tokyo Metro Co., Ltd. (Tokyo Metro) disclosed data about the locations of trains on all of its lines and about train delays. It was the first Japanese railway operator to disclose such data as open data. In addition, Tokyo Metro held the “Open Data Application Contest,” a competition for apps that use the corresponding open data. A very high number of apps were submitted in the contest, and many were evaluated highly. As a result, Tokyo Metro decided to continue disclosing the data even after the contest ended. In this paper, we will report the details of the open data related to train locations and delays.

Development of “Error Evasion Skills Improvement Program” for Crew
Takeshi URUSHIHARA, Yuuichi SAKUYAMA, Hiromichi NAGASHIMA

We have developed an education program with the intention of cultivating a crew that can take flexible and optimal actions by setting human lives as the first priority during large-scale natural disasters, such as the Great East Japan Earthquake in March 2011, and in emergency situations that cannot be handled only through manuals. This education program was developed by referring to the CRM (Crew Resource Management) training that is exercised in the airplane industry. This paper introduces the outline, development history, etc. of this program.

NEWS

To the Readers
Hiroshi NARUSHIMA

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