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Maintenance of Signalling Equipment Employing New Technology 2

Tomohiko YUZURIHARA

East Japan Railway Company places top priority on providing a safe, high quality railway transportation service which is demanded by our customers. To this end, we carry out reliable maintenance of equipment and also tackle various problems in order to prevent transportation trouble before it happens or promptly restore the equipment in the event that trouble occurs. This paper describes our efforts aimed at improving management and maintenance of signalling equipment through the adoption of new technology.

History and efforts for the future regarding inspection and repair based on rolling stock data for Shinkansen rolling stock 5

Masahiro SUZUKI, Kyoichi NISHIMURA, Atsuo UTANO

Last year, Tokaido Shinkansen celebrated its 50th anniversary. During this period, the rolling stock have been developed and also new technology has emerged in the areas of inspection and repair facilities for rolling stock. For the inspection and repair of Shinkansen rolling stock, we are devoting our efforts to establish a new organization for inspection and repair that allows full use of rolling stock data and have established an organization to record, transmit, and analyze abundant data obtained from the vehicles. By making use of the rolling stock data, it is possible to more efficiently organize inspection and repair works as well as improve the safety and stability of transportation. This article describes the establishment of a system for obtaining and analyzing rolling stock data, track records regarding the rolling stock data analysis, and a new method of use of the data.

Development and practical application of a bridge maintenance management system using 3D models 9

Akihiro NAKAZAWA, Tomohiro SHIMIZU, Yasumasa TAKAHASHI

For adequate maintenance of bridge structures, it is important not only to accumulate data in a maintenance cycle but also to update and edit the data to the latest data as necessary. This paper introduces a system we have developed to identify the positions and shapes of deteriorations from photographs by generating 3D models, and to grasp their exact quantities and manage the data chronologically. It also describes how we are provisionally starting to use the system for bridge maintenance management on the Hokuriku Shinkansen railway line prior to practical application.

Development of a new type bogie for reducing the risk of derailment 12

Takefumi MIYAMOTO, Mitsugi SUZUKI, Syogoro KAMOSITA, Shinichi KODAMA, Yasuhiro UMEHARA

The target of developing a new type of bogie is to achieve higher safety performance of railways. The new type bogie structure has two characteristic functions of being able to reduce risk of flange climbing derailment. One is to steer the wheel set by providing small lateral force to the wheel by the steering actuator. The other is to control the decrement of the wheel load of the bogie following a twist track section. This paper introduces a mechanism of the bogie, and reports results of the hunting stability tests and the running tests of the new bogie.

Effects of Tokyo Metro’s Installation of PMSM Propulsion System and its Commitment to Further Energy Savings 15

Hiroshiki KAWAI, Yosuke TASHIKA, Satoru OHASHI, Hirofumi SHIMAZAKI

Over the last seven years, Tokyo Metro Co., Ltd. has been installing a permanent magnet synchronous motor (PMSM) propulsion system to save energy. The company is also using a main circuit system, which features newly developed PMSMs and SiCs, for the Set No. 7121 Train (3rd generation), which started operation in April 2015, to achieve even greater energy savings. This article introduces the history and energy-saving effects of the PMSM propulsion system that has been installed and the company’s commitment to further energy savings.

Efforts Aimed at Additional Safety of Conventional Lines Owned by the West Japan Railway Company 18

Masaki OMORI, Hiroyuki KIDO, Naoto SHIMADA

We are engaged in the running of conventional railway lines which include approximately 5,300 cars. In order to improve the safety of these cars, it is important not only to develop safety improvement methods, but also to systematically adopt new rolling stock and improve existing rolling stock, and also to carry out horizontal development of it. This paper shows the flow of development of our conventional rolling stock and also the efforts that we are making to improve safety. It also indicates the method of development and the role to be played by a railway operator in order to ensure ongoing improvement of safety in the future.

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