6. Summary

[The railway accidents occurred from 2002 to 2017, and subjected to the investigation]
- Among total 273 accidents subjected to the investigation, category "derailment accident" was the greatest number 190 accidents, *i.e.*, 70 %.
- Among derailment accidents, 34 % were caused by the maintenance or handling of railway operators.
- The most of the derailment accidents caused by maintenance or handling of railway operators were caused by the maintained status of the ground facilities such as the track, etc., 51 %.
- The derailment accidents caused by the maintained status of ground facilities such as the track occurred in local railway operators in high ratio, 82 %.
- Among the derailment accidents occurred in local railway operators, 10 accidents were caused by the gauge widening, among these, four accidents occurred in the period from October 2016 to May 2017.
- On June 28, 2018, the JTSB issued its opinion to the Minister of MLIT, on the prevention of train derailment accidents due to the gauge widening.

Besides, when we interviewed the Tohoku Railway Association to draw this digest, we also heard on the possibility that the proper maintenance management is affected by the following problems, *i.e.*, the local railway operators were in severe circumstances due to the decrease of the track side population and the decrease of the transport passengers accompanied to the change to use private cars, and the facilities were deteriorating because the positive investment in facilities could not be implemented, and the lacked knowledges in the site accompanied to the difficulty of technology succession such as lacked engineers and aging of engineers due to the reduction of personnel and restrained employment.

There is the risk to cause many casualties once the train derailment occurred in the railway transportation. Therefore, it is necessary for the railway operators to complete their obligation certainly to keep safety transportation and never cause the accident, by implemented the management of the track maintenance, etc., properly.

As a help to complete their obligation, the technical support and the technology development implemented in each corporation, and the national subsidy system are introduced in this digest. We hope the effective use of these information by each railway operator according to their judgement.

To edit this digest, we obtained the cooperation from Railway Technical Research Institute, Japan Railway Construction, Transport and Technology Agency, Japan Railway Civil Engineering Association, Japan Railway Rolling Stock & Machinery Association, the Tohoku Railway Association, and other many relevant parties, we express many thanks.

Comment of the Director of the Analysis, Recommendation and Opinion

Most infrastructures, not limited in railways, are the system that "the completion of construction is not the conclusion", *i.e.*, the deterioration started from the day of completion, although there is difference in the deteriorated levels. Therefore, it is important to secure safety by the proper maintenance management, etc., and take measures to restrain the occurrence of accidents.

The proper maintenance management, etc., of the facilities is needed for long term as far as the business continues, and then the required technical abilities were not allowed to deteriorate by years. For that purpose, it is considered as important to promote, in cooperation with each railway operator and relevant corporation, etc., the "cooperation to bring up talented people" such as the improvement and the succession of technologies, and the "cooperation in the practical duties" such as the commonly possession of technologies and knowhow, as introduced in this digest, on the measures which became difficult to be taken in each operator alone by the change of the surrounding status.

The opinion on the JTSB digest and the order of the visiting lectures are welcome.

Att.
The Accident Prevention Analyst
Assistant to Director for Management
Secretariat
JAPAN TRANSPORT SAFETY BOARD
15th Floor, Yotsuya Tower
1-6-1, Yotsuya, Shinjuku-ku, Tokyo
160-0004, Japan
TEL +81-3-5253-8823 (Ext.54236)
FAX +81-3-5253-1680
URL http://www.mlit.go.jp/jtsb/index.html
e-mail : hqt-jtsb_bunseki@gxb.mlit.go.jp