Japan-Led International Standard on Compatibility Between Rolling Stock and Train Detection Systems Revised

The Railway Technical Research Institute (RTRI) established the Railway International Standards Center (RISC) to promote the development of international standards for railway technologies in collaboration with RISC member organizations. The International Electrotechnical Commission (IEC) has issued the revised Japan-led international standard IEC 62427, which addresses compatibility between rolling stock and train detection systems (hereinafter referred to as "this standard").

1. Background

Safe train operations rely on signal control and traffic control systems, which require effective train detection mechanisms. However, train detection systems can malfunction due to electromagnetic fields generated by on-board equipment and return currents flowing through rails. Therefore, before operation, it must be confirmed that train detection systems are functioning normally without electromagnetic interference (electromagnetic compatibility between rolling stock and train detection systems[*1], as shown in Fig. 1).

When introducing new rolling stock, railway operators confirm that it does not adversely affect train detection systems and create documentation to record this confirmation.

[*1] Electromagnetic compatibility: The ability of equipment or systems to function as intended without causing or experiencing unacceptable electromagnetic disturbance.

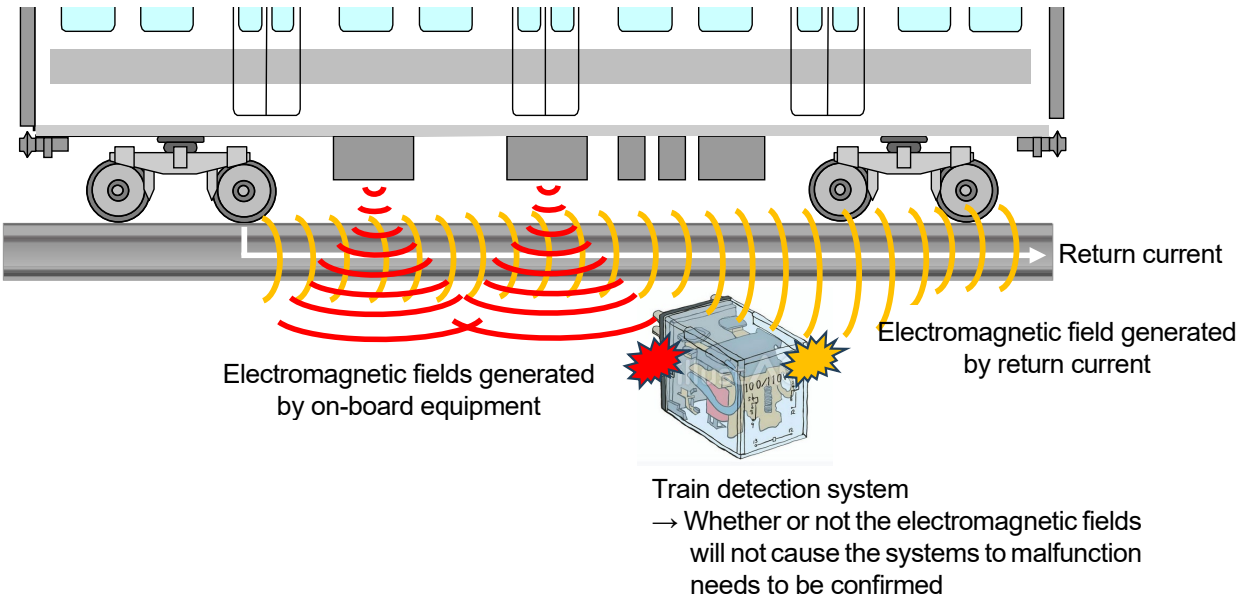

Fig. 1 Illustration of Electromagnetic Compatibility Between Rolling Stock and Train Detection Systems

2. Brief History of the Revision

The procedure for verifying compatibility between rolling stock and train detection systems has been internationally standardized since 2007.

(1) Establishment of Standard

2005: European proposal to develop an international standard based on EN 50238:2003

2006: Japan assumes leadership for deliberations after approval of the European proposal

2007: Publication of the international standard IEC 62427:2007 ED1 (first edition)

(2) Revision of Standards

2020: European proposal for revising the international standard based on EN 50238:2019[*2] (revised the previous year)

[*2] Revision of the 2003 edition, partially modifying the flow chart illustrating the procedure for checking electromagnetic compatibility

2021: Japan assumes leadership for deliberations after approval of European proposal for the revised standard

2024: Publication of the international standard IEC 62427:2024 ED2 (second edition) on December 4

Fig. 2 Participants of Maintenance Team 62427

3. Overview of This Standard

Despite the proposal from Europe based on the European standard EN 50528:2019, Japan led the revision process, collaborating with other countries to create the revised draft, achieving the following results:

(1) The revision of provisions citing existing European standards resulted in a neutral set of provisions widely accepted internationally, including Japan.

(2) The revision of the flow chart illustrating the procedure for proving electromagnetic compatibility and related provisions clearly positioned the procedures commonly used in Japan within the flow chart.