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**TB**

**RAILWAY INDUSTRY STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**TB/T 2640-1995**

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**Structural Design for Fire Protection of Passenger Train  
(English Translation)**

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### Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces TB/T 3074-2003 "Technical specification for protection against lightning electromagnetic impulse on railway signaling equipment". In addition to editorial changes, as compared with TB/T 3074-2003, the main technical changes of this standard are as follows.

- MODIFY various factors of the lightning hazard risk to railway signaling equipment (SEE 5.1; chapter 4 of the 2003 version);
- MODIFY the "Principles of lightning electromagnetic pulse protection for signaling equipment system" into "Basic requirements of lightning electromagnetic pulse protection for signaling equipment system" (SEE chapter 4; chapter 5 of 2003 version);
- MODIFY the division of lightning protection zone (SEE chapter 4; chapter

### 6 of 2003 version);

- DELETE the improvement of the lightning electromagnetic pulse of signaling equipment (SEE chapter 6 of 2003 version);
- ADD the external protection and internal protection of the signaling equipment room (SEE 4.3, 4.5);
- ADD specific requirements and implementation methods for external and internal protection of signaling equipment rooms (SEE 5.4.1);
- ADD the direct-attached continuous screening requirements for electronic

equipment rooms (SEE 5.4.2.3);

- MODIFY the requirements for the installation of coordinated SPD system

(SEE 5.4.3; chapter 8 of 2003 version);

- DELETE the "Test of protection level of lightning electromagnetic pulse of signaling equipment" (SEE chapter 9 of 2003 version);

- MODIFY grounding requirements and technical parameters (SEE 5.4.1.3, 5.4.1.4; chapter 10 of 2003 version);

- MODIFY "Division of lightning protection zones and making of conformance earth potential connections" (SEE 4.4, Figure 2; Appendix A of 2003 version);

- ADD "Determination of the scope of lightning protection" (SEE Appendix A);

Technical specification for protection against

lightning electromagnetic impulse on railway

signaling equipment

## 1 Scope

This standard specifies the basic principles and protective technical requirements for the railway signaling equipment for over-voltage and over-current protection induced by lightning electromagnetic pulse.

This standard applies to the design, construction, manufacture and maintenance of the integrated lightning protection system for the newly built railway and for the reconstruction and expansion of existing railway signaling equipment. The integrated lightning protection measures for the other electronic equipment system can refer to this standard.

This standard does not consider the protection of the signaling equipment under direct lightning.

## 2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable

to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

TB/T 2311 Surge protective devices for railway signal system

### 3.1 Terms

The following terms and definitions apply to this document.

#### 3.1.1

Lightning electromagnetic impulse

#### 3.1.13

Cable entrance earthing bar

A dedicated earthing bar connecting the cable steel jacket entering into the machine room to the general earthing bar or ring grounding electrode at the entrance.

#### 3.1.14

Lightning equipotential bonding

To reduce the potential difference created by lightning current, a lightning protection measure that connects the isolated conductive components directly to the lightning protection system either directly or through a surge protector.

#### 3.1.15

Lightning protection device

Equipment used to limit lightning transient overvoltage AND to shunt lightning surge currents.

#### 3.1.16

SPD surge protective device

A lightning protection device to limit transient overvoltage AND to discharge surge current, which contains at least one non-linear element.

**Note 1:** Surge protective device is also known as power protection cable, lightning protection device, lightning protector, lightning arrester and so on.

**Note 2:** The surge protective device is divided into single port SPD and dual port SPD.

3.1.17

Maximum continuous operating voltage

UC

The maximum AC voltage r.m.s. or dc voltage value that can be permanently applied on the SPD of various protection modes.

3.1.18

3.1.23

Railway integrated earthing technology

A grounding system which connects the traction power supply, power supply, signal and communication systems, buildings, road beds, platforms, bridges, tunnels, sound barriers, etc., along the railway which require grounding through the common earthing system.

3.1.24

Through-railway grounding wire

Grounding electrode laid along the railway to connect all kinds of equipment and facilities, AND used as the auxiliary passage for the traction backflow.

### 3.2 Abbreviations

The following abbreviations apply to this standard.

CEEB. Cable Entrance Earthing Bar

EMC. Electro Magnetic Compatibility

ERP. Earthing Reference Point

LEMP. Lightning Electromagnetic impulse

LP. Lightning Protection

LPS. Lightning Protection System

LPZ. Lightning Protection Zone

PE. Protective Earthing