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PEOPLE'S REPUBLIC OF CHINA**

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**Railway applications - Guide for the lightning protection of DC
overhead contact systems**

轨道交通 直流架空接触网雷电防护导则

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. Please note that some of the contents of this document may involve patents. The issuing organization of this document is not responsible for identifying these patents. This standard was proposed by the National Railway Administration. This standard is supported by the National Traction Electrical Equipment and Systems Standardization Technical Committee (SAC/TC278) and the National Lightning Protection Standardization Technology. The committee (SAC/TC258) is under the jurisdiction. This standard is drafted by: Tianjin China Railway Electrification Design and Research Institute Co., Ltd., China Electric Power Research Institute Co., Ltd. Participated in the drafting of this standard. Beijing Electric Power Economic and Technological Research Institute, State Grid Electric Power Research Institute Wuhan Nanrui Co., Ltd., Guang State Subway Group Co., Ltd. The main drafters of this standard. Wang Litian, Chen Weijiang, Shen Haibin, Zhao Haijun, Bian Kai, Xiang Nianwen, Huang Deliang, Wang Yanli. Rail Guide for lightning protection of overhead overhead contact networks

1 Scope

China's national guide to protecting DC overhead contact systems from lightning. It specifies the terms and definitions, the characterisation of lightning activity, the protection principles, the protective measures and the assessment. A DC electrified railway presents lightning with an unusually attractive target: a conductor a few metres above the ground, running for hundreds of kilometres across open country, often on embankments and viaducts that are the highest points around. A strike puts a surge of tens of kiloamperes onto the contact wire, and it travels both ways along it into the substations, the section insulators and any train that happens to be drawing current. DC systems are harder to

protect than AC ones for a specific reason: there is no natural current zero, so an arc that strikes across an insulator does not extinguish itself as it would on alternating current, and a flashover becomes a sustained short circuit that has to be cleared by the protection.

This standard stipulates the lightning protection principle, protective measures and implementation plan for overhead contact network of urban rail transit. This standard is applicable to urban rail transit ground and elevated section overhead contact nets with DC 1500V traction power supply, using DC Ground and overhead section overhead contact nets with traction power of 750V and below can be implemented by reference.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 11032 AC gapless metal oxide arrester

GB/T 25890.5 Rail switch ground equipment - Part 5. DC arresters and low-voltage limiters

GB/T 32520 AC 10V or more with external series gap metal oxide arrester (EGLA) for overhead transmission and distribution lines

GB/T 50064-2014 AC electrical equipment overvoltage protection and insulation coordination design specifications

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Cloud flash intra-cloud discharge The phenomenon of atmospheric discharge occurring inside the same cloud and between different clouds.

3.2 Ground flash cloud-to-ground lightning flash Atmospheric discharge between the cloud and the earth or ground.

Note. Rewrite GB/T 21714.1-2015, definition 3.1.

3.3 Lightning striking A single air-to-cloud discharge.

Note. Rewrite GB/T 21714.1-2015, definition 3.4.

3.4 Lightning current The current flowing through the lightning strike point. [GB/T 21714.1-2015, definition 3.9]

3.5 Thunderstorm day thunderstorm day There are thunder days in a certain area in a year. Just hear more than one thunder in a day or see more than one lightning, even a mine A stormy day.