

The paper provides a review of the present practice of DC traction power system grounding methods employed in North America. An analysis of equipment grounding, system grounding and their relationships to achieve optimized equipment and personal safety is derived. Generic protective relay schemes commonly used in the DC equipment enclosure grounding ...

distribution and DC traction systems are mainly serving the ... the power dissipation by the grounding system, insulation level, and service continuity for the sensitive loads. Considering the ...

1653.6-2013 IEEE Trial-Use Recommended Practice for Grounding of DC Equipment Enclosures in Traction Power Distribution Facilities. The grounding of dc equipment enclosures installed in dc traction power distribution facilities as well as related insulation treatments required for solid and resistance grounding methods are covered in this standard.

As the exploitation of DC traction systems with high safety factors is completely tied with the grounding system, an acceptable safety for the public, personnel, and operators is...

A fault protection and location method for ungrounded dc traction power systems is presented in this paper. Many dc traction power systems have an ungrounded power circuit to increase the leakage path resistance. Although ungrounded systems can continue operating with a single ground contact, unlike solid- or low-resistance grounded systems, because of the very ...

Insulating switch machines at the switch rods. Utilizing separate traction power substations for the main line, yard, and shop. Shop tracks are solidly grounded for maintenance personnel safety. ...

A probe unit is used to detect and locate the first single ground fault in ungrounded traction power systems and the probe unit applies probe voltage to detect the fault and, once the fault is detected, analyzes the response to dc or swept-frequency ac probe Voltage to locate the fault. A fault protection and location method for ungrounded dc traction power systems is ...

Considering the introduced functional characteristics and technical issues, and knowing their interaction with DC grounding systems, one can precisely choose the proper grounding system for a ...

Wang proposes a DC auto-transformer traction power system to suppress RP and SC by analysing the effect of OVPD action on the RSP of the return system [23]. Du studies ... FIGURE 1 Overall structure and different grounding modes of DC subway system. drainage mat is mainly used to absorb SC and prevent the system from generating a large amount ...

# Dc traction power system grounding

A DC traction power supply system (DC TPSS) is commonly adopted in subway systems, in which running rails are the path of return current. The safe operation of the DC TPSS has become an important issue for such systems. The longitudinal resistance of the rails creates potential difference between the rail and ground as the traction current of ...

A method is proposed by transforming the DC traction power supply system circuit into the Bergeron equivalent circuit and calculating the voltage distribution of the catenary and verifying the accuracy of this approach. Due to the increased strain of the urban ground traffic, the DC railway transit system has been developed rapidly to solve the traffic problems.

In this paper the electrical safety of DC urban traction systems is analysed, with particular focus on fault current detection and on dangerous voltages which could arise in case of fault. For the discussion the tram network of Turin, Italy, is used as a case study. Firstly the structure of the DC traction power supply is described; then the safety of the system is ...

The paper presents a comprehensive review on the topic of DC grounding systems. The existing grounding strategies for DC-systems are comprehensively reviewed, and their ...

Electric Traction Power; Stations; Links on Infrastructure; Signalling. Basic Railway Signalling; ... Diagram showing a 3rd rail DC power supply system and how current rail gaps are provided where the substations feed the line. ... above the zero of the ground, it works very well and has done so for the last century. Of course, as many railways ...

Carl B. Wessel Mr. Wessel is a traction power designer with a civil engineering background and more than 30 years of experience in both engineering, and owner/operator managerial roles in the areas of traction power (TPS) and overhead catenary systems (OCS) design, construction, operations, and maintenance.

DC traction power systems are usually adopted in multitrain subway systems with running rails being used as the return conductor for traction current. Multiple traction substations (TSSs) and multiple trains run in parallel with complex operation conditions. Fast and accurate calculation of the dynamic power flow in the system has become an important issue. In this ...

Traction Power Return System - A traction power return system refers to all conductors including the grounding system for the electrified railway tracks, which form the intended path of the traction return current from the wheel-sets of the traction units to the substations under normal operating conditions and the total return current under

Practical Solutions for DC Traction Power Substation Grounding. This paper describes how a key component for the overall safety of personnel, reliability and electrical performance of DC traction power substations is the grounding system. Effective grounding enhances the fast draining and clearing of fault currents and improves the safety and ...

# Dc traction power system grounding

1 INTRODUCTION. At present, DC traction power supply system is generally used in subway lines. When the simultaneous operation of multitrain, a voltage between the rails and the ground will exist for the longitudinal resistance of the running rails, which is called rail potential (RP) []. Partial return current leaks out and forms stray current (SC) in the return system for ...

The considered technical issues include personnel/equipment safety concerns, lifetime considerations, detection of DC faults, overcurrent/overvoltage during fault conditions, ...

Currently most modern dc rapid transit systems around the world use running rails or a negative rail as the negative return circuit for the dc traction current. These rails are intentionally kept ungrounded from ground (earth) by using insulating material between the rail and earth to minimize dc stray current. This configuration of return current rail develops varying voltage ...

Traction power systems (TPSs) play a vital role in the operation of electrified railways. The transformation of conventional railway TPSs to novel structures is not only a trend to promote the ...

This paper describes how a key component for the overall safety of personnel, reliability and electrical performance of DC traction power substations is the grounding system. Effective grounding enhances the fast draining and clearing of fault currents and improves the safety and dependability of an electrical system. High fault current levels can introduce the catastrophic ...

DC traction power system grounding. Article. Jun 2002; Dev Paul; This paper provides a review of the present practice of DC traction power system grounding methods employed in North America. An ...

This grounding configuration is also named a virtually-grounded DC system because this scheme is mainly used in DC power systems in the absence of neutral points [128], [130]- [132], [134]- [136] ...

operation despite control power loss The perfect negative grounding device for your floating negative network. 8 | DC traction power supply and wayside energy management DC traction power supply and wayside energy ... ENVILINE ESS is a wayside Energy Storage System (DC connected) which recovers, stores and returns the surplus braking energy to ...

This paper provides a review of the present practice of DC traction power system grounding methods employed in North America. An analysis of equipment grounding, system grounding, and their relationships to achieve optimized equipment and personal safety is derived. Generic protective relay schemes commonly used in the DC equipment enclosure grounding are ...

To ensure the stable operation of AC/DC hybrid system, the grounding mode analysis is necessary, which is the precondition for overvoltage analysis, lightning arrester configuration, and protection design. ... the structure of flexible DC power distribution system in Guizhou power grid has presented. The &#177;375 V

DC system is directly grounded ...

Contrary to the DC network grounding methods discussed earlier, in Ref. [51], it presents reconfigurable grounding methods for DC traction networks, where the network is operated in ungrounded configuration to reduce the corrosion intensity, and upon detection of a high voltage, the network is grounded to reduce the voltages to safe levels.

In this paper, the traction power supply system is modelled, and the capacity constraint of the BCD is considered. The AC/DC power flow algorithm of the traction power supply system with the mentioned model of the BCD is proposed. The EBF algorithm is applied and a parameter strategy with three layers and double loops is designed.

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