What does the 35kV bus voltage depend on



Overview

35 kV Switchgear: High-Voltage Distribution Design GuideEnwei Electric provides 35 kV switchgear with vacuum interrupters, robust bus systems, arc-resistan.

Key Takeaways

Voltage variation on a 35 kV bus is influenced by load changes, system impedance, and bus design, typically maintained within ±5% of nominal voltage for reliable operation.

Factors Affecting Voltage Variation

Load Fluctuations: Sudden changes in load can cause voltage drops or rises on the bus. For a 35 kV bus, the system must be designed to handle peak currents without exceeding voltage limits, considering the rated continuous current of bus and feeders, which typically ranges from 1250 A to 3150 A. System Impedance: The impedance of transformers, cables, and busbars affects voltage drop.

For example, a 75 MVA transformer at 34. 5 kV produces a rated current of 1. 255 kA, and the distribution among parallel cables influences voltage stability.

Bus Configuration: Metal-enclosed or cable bus systems must be designed to minimize unbalance and voltage drop. Proper spacing, parallel conductor arrangements, and cooling considerations help maintain voltage within acceptable limits. Protection and Switching Devices: Vacuum breakers, relays, and disconnect switches help isolate faults and maintain voltage stability.

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Accurate CT/VT metering and protective relays (50/51, 27/59, 46, 49) ensure that voltage deviations are detected and corrected promptly.

Design Considerations

Insulation and BIL Ratings: 35 kV busgear typically has a BIL of 170 kV, ensuring insulation withstands transient overvoltages.

Short-

Circuit Withstand: Busbars must handle short-time currents of 25–40 kA without excessive voltage drop or damage. Cable Bus and Busway: Proper sizing of cables or busbars, including parallel runs and spacing, reduces voltage drop and unbalance. For example, using multiple parallel cables per phase improves ampacity and voltage stability.

Environmental Factors: Altitude, temperature, and pollution degree affect insulation and voltage variation, requiring appropriate creepage and clearance design.

Operational Guidelines

Maintain voltage within ±5% of nominal 35 kV to ensure equipment protection and system reliability. Monitor bus voltage using accurate VT/CT measurements integrated with SCADA systems for real-time control. Ensure proper coordination of surge arresters and grounding to mitigate transient overvoltages.

Regular maintenance of bus connections, vacuum interrupters, and cable terminations reduces voltage variation caused by contact resistance or aging. By considering these factors, a 35 kV bus system can maintain stable voltage under varying load conditions, ensuring safe and reliable operation of connected equipment.

Article Content

35 kV Switchgear: High-Voltage Distribution Design Guide

Enwei Electric provides 35 kV switchgear with vacuum interrupters, robust bus systems, arc-resistant options, and modern relay suites. See Enwei

Functional Specification for 15 kV, 25 kV, or 35 kV Underground

Overall height, width, depth and layout shall conform to the manufacturer''s standard construction practices for the configuration, ratings, and voltage class specified.

35kV Substation Electrical Design

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How does the choice between inner bridge wiring and single bus wiring affect the reliability and economy of a 35kV substation''s design? The inner bridge wiring method is less reliable but more economical

35KV POWER TRANSFORMERS

GRID offers custom-built 35kV power transformers that are primarily used in utility substations, industrial facilities, and renewable energy projects to step up or step down voltage for efficient power distribution.

Basic Insulation Level (BIL): Definition, Table, Formula

The increased BIL requirement is necessary due to the higher operating voltage, greater exposure to lightning and switching overvoltages, and longer insulation and clearance distances

Six common bus configurations in substations up to 345 kV

This technical article explains six most common bus configurations used for distribution, transmission, or switching substations at voltages up to 345 kV. Presented single line diagrams and

OverviewofFundamentalPrinciplesand ComponentsofKET-35kVHigh

Common types (classified by function) 1. Infeed cabinet: Also known as the receiving cabinet, it is the "first stop" for 35KV high-voltage electricity entering the distribution cabinet. It is mainly equipped with

Design and electrical calculations for 110(220)/35/10 kV power ...

Generally, a primary substation includes a high-voltage busbar system, medium-voltage busbar system, auxiliary system, and one or several main transformers. In order to provide

What Is Bus Voltage and How Does It Work?

A DC bus overvoltage fault typically comes from one of three causes: high incoming line voltage, a motor being back-driven by a heavy load, or electrical harmonics on the supply power.

Bus Bars and Bus Ducts Design Requirements ANSI C37.23

Bus Bars and Bus Ducts Design Requirements ANSI C37.23 This article is for manufacturing, testing of non-segregated Bus Bars and Bus Ducts rated 600 V to 35 kV as per international standard ANSI

What Is Bus Voltage and How Does It Work?

Bus voltage is a shared electrical reference point that powers everything from motor drives to USB devices. Here''s how it works across different systems.

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35kV Cable Bus Application

Anyone have any experience with using cable bus for 35kV applications with short distances? I''m looking at a preliminary design which uses (6) sets of 750MCM cables installed

How are the grounding resistor value and grounding transformer for a

Tests by Shanghai power authority confirm that even 1000 A does not exceed permissible interference voltages. 4) Personnel safety: Smaller resistor current is safer. Low

The essence of understanding and analyzing

Distribution systems 5kV-35kV The distribution system shown below illustrates many of the features of a distribution system making it unique. The

Rating and Service Conditions

For low frequency voltage, the values are expressed in rms, and are for a specific time. For impulse voltage, the values are expressed in crest of a specified wave. AMBIENT TEMPERATURE Standard

5kV vs. 15kV vs. 25kV vs. 35kV Medium Voltage Cable:

Compare 5kV, 15kV, 25kV, and 35kV medium voltage cables. Master technical specs and market applications to optimize your inventory and provide

SubstationDesign_2014-2015_Final_DP

Table 8 shows the comparison between various maximum system voltages and BILs associated with these voltages. The comparison is intended ONLY to illustrate the ratio has

Low and Medium Voltage Metal-Enclosed Cable Bus Guide Specification

This specification describes the electrical and mechanical requirements for metal-enclosed, non-segregated phase cable bus duct from 600V through 38kV applications.

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