

10kV bus phase-to-phase discharge overvoltage

Article Overview

Phase-to-phase discharge overvoltage on a 10 kV bus occurs when transient or fault conditions cause voltage between two phases to exceed insulation limits, potentially damaging equipment and triggering protective relays.

Causes of Phase-to-Phase Overvoltage

Phase-to-phase overvoltage on a 10 kV bus can arise from several factors:

- **Switching Transients:** Sudden opening or closing of circuit breakers or disconnectors can generate voltage spikes due to inductive and capacitive interactions in the bus and connected feeders .
- **Lightning or External Surges:** Direct or nearby lightning strikes can induce high transient voltages across phases, especially in outdoor or exposed bus configurations .
- **Capacitive Coupling and Resonance:** Busbars and connected capacitor banks can create resonant conditions, amplifying voltage between phases during switching or fault clearing .
- **Fault Conditions:** Short circuits or arcing faults between phases can produce rapid voltage changes, leading to overvoltage before protective devices isolate the fault .

Effects on the Bus and Equipment

- **Insulation Stress:** Overvoltage can exceed the dielectric strength of bus insulation...

Article Content

Dec 20, 2025

Distribution Characteristics of Induced Overvoltage Along 10 kV ...

This paper reports the waveform characteristics and parameters of the overvoltage at the terminal of a 1.5km 10kV

Mar 02, 2026

SUBSTATION ELECTRICAL BUS AND PARTS CLEARANCES

Considerable information has been published by CIGRE relative to establishing phase-to-phase air clearances in EHV substations as

Apr 17, 2026

Active Discharge and Pre-charge of EV High Voltage Power Bus

SW1 is used to detect SHORT circuit on HV DC Bus. Capacitor is charging thru SW1 that is activated by MCU. When the HV DC Bus

Aug 25, 2025

DC Bus Overvoltage White Paper

Numerous built-in protections and fault indications are provided with modern VFDs, including the commonly seen DC Bus

Aug 19, 2025

Chapter 2

Capacitor banks are used to control bus voltages. The following topics will be discussed:

Jan 01, 2026

Electrical Overvoltage: What It Is | Solera

What is an overvoltage? An overvoltage is an increase in the electrical supply voltage above the established nominal

May 05, 2026

Overvoltages and insulation coordination in MV and HV

Overvoltage caused by an insulation fault (see fig. 2) An overvoltage due to an insulation fault occurs on a three-phase network when

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SF6 breaker failure, high voltage breaker failure, line switch ...

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Oct 29, 2025

Development of a Lightning-Induced Overvoltage ...

This paper reports the waveform characteristics and parameters of the overvoltage at the terminal of a 1.5km 10kV

Apr 16, 2026

Distribution Characteristics of Induced Overvoltage Along 10 kV ...

This article presents the induced overvoltage caused by nearby artificial-triggered lightning at different observation points on 10 kV

Nov 27, 2025

Threeâ phase overvoltage at lightning strike point due to direct ...

Abstract This paper reports the observation results of three-phase overvoltage at the lightning strike point of a 1.5 km, 10 kV power

Nov 21, 2025

Evaluation of lightning-induced overvoltage on a 10 kV distribution ...

Studies have shown that 90% of power interruptions on distribution lines are caused by lightning-induced overvoltage,

Oct 08, 2025

The essentials of LV/MV/HV substation bus overcurrent and

Using metal-enclosed bus duct or insulated cable not directly exposed to lightning contributes to reliability. To further

Oct 26, 2025

Overvoltage Protection of Series-Connected 10kV SiC ...

The methodology uses an active voltage clamp at the gate terminal and desat detection technique to identify abrupt

Apr 07, 2026

Regenerative Drive Failures: How to Fix DC Bus Overvoltage

If the DC bus keeps spiking, something in the system is pushing too much power back into the drive. The real question is, where's it

Nov 27, 2025

Research on overvoltage and minimum air clearance on 1000 kV AC

Tests are carried out on air clearances between bundle conductors, tubular buses, and equipment grading rings

Feb 28, 2026

Minimum Approach Distance Calculator | Occupational Safety and

You can use this page to calculate minimum approach distances for phase-to-phase system voltages exceeding 72.5 kilovolts in

Dec 08, 2025

TD235022EN Effective August 2017 Supersedes March 1997 (TD-220

Continuous voltage Gapless surge arresters must be selected with sufficient steady-state self impedance to withstand the application

Dec 19, 2025

DC Bus Overvoltage White Paper

Three-phase (sometimes single-phase) power is connected to the input terminals and fed through a full-wave rectifier, converting the

Sep 30, 2025

Understanding the Arrester Datasheet

Discharge Voltage Table In every arrester datasheet, you will find a most important table about the discharge voltage of the arrester

May 23, 2026

Overvoltage Protection of Series-Connected 10kV SiC MOSFETs

This paper presents a design methodology for overvoltage protection across 10kV SiC MOSFETs during turn-off after

Sep 12, 2025

what is meant by "DC bus overvoltage issue" in

The DC bus voltage is sampled in A/D interrupt (4-point running average). If the average DC

Feb 18, 2026

Overvoltage protection 1

1. Overvoltage of atmospheric origin 1.1 Overvoltage definitions Overvoltage (in a system) Any voltage between one phase conductor

Mar 30, 2026

APPLICATION GUIDE Metal-oxide Surge Arresters

plied in a phase-to-phase protection manner. Overvoltages may arise between phases when a transformer or reactor is switched of.

Aug 17, 2025

VFD Overvoltage Fault on Power-Up: Deep Analysis of

In practical field maintenance, overvoltage faults in variable frequency drives (VFDs) are

Mar 27, 2026

Troubleshooting VFD Problems – Overvoltage Fault

Any and all events that could cause a jump in DC bus voltage could lead to a dc link overvoltage fault event. This

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