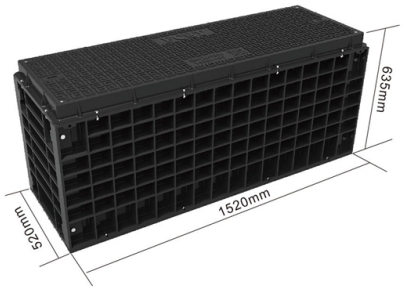
35kV bus voltage abnormality



Overview

Explore the detailed cause analysis and retrofit strategies for a 35kV GIS voltage transformer accident. Learn about design flaws, protection upgrades, and maintenance improvements to prevent failures ...

Key Takeaways

Abnormal 35 kV bus voltage can result from single-phase grounding, fuse blowouts, or resonance, and requires careful diagnosis and timely corrective action to maintain system reliability. Common Causes of 35 kV Bus Voltage AnomaliesHigh-Voltage Fuse Blowouts: When a single-phase, two-phase, or three-phase high-voltage fuse blows, the voltage of the affected phase drops significantly. If the fuse is partially blown, a bus grounding signal may not be triggered, making detection more challenging.

Single-

Phase Grounding Faults: A grounded phase voltage drops close to zero, while the other two phases rise to line voltage levels. This often triggers a “busbar grounding” alarm. Indicators include dimming of the faulted phase VT light and brightening of the healthy phases.

Resonance (Ferroresonance): All three-phase voltages rise abnormally but remain balanced. The bus voltage transformer may emit a buzzing sound, and overvoltage can reach 1. 5–3.

5 times the normal phase voltage. No bus grounding signal is typically issued.

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Low-

Voltage Fuse Blowouts: Secondary voltage drops significantly without triggering a busbar grounding signal.

Identification and Diagnosis

Voltage Transformer (VT) Observations: Check VT indicator lights; the faulted phase dims while others brighten. Measure $3V_0$ output to detect neutral displacement voltage.

SCAD

A and Alarm Signals: Look for “35 kV busbar grounding” or arc suppression coil activation signals. These provide early warning without tripping the system. Physical Inspection: For faults within the substation, visible arcing, smoke, or unusual noises can help locate the fault.

Corrective Actions

Immediate Notification: Alert central control and dispatch line operation teams to inspect equipment and protection status. Trial Switching or Remote Tripping: After confirming the fault, perform trial switching of lines or remote tripping via SCADA, ensuring critical loads are managed. Load Transfer: Prioritize transferring load from the faulty line before isolating it to prevent cascading outages.

Equipment Isolation: Faulted equipment should be isolated promptly, typically within 2 hours, to prevent overheating and damage to arc suppression coils. Monitoring and Maintenance: Continuously monitor bus voltage, VT readings, and arc suppression coil currents to prevent recurrence.

Operational Considerations

Abnormal bus voltage can indicate system reactive power imbalance and may affect overall network reliability. Timely detection and handling prevent voltage collapse, phase-to-phase short circuits, and potential large-area blackouts. Maintaining proper grounding, fuse integrity, and monitoring of arc suppression coils is critical for safe operation.

By systematically diagnosing the type of anomaly and following structured corrective procedures, operators can maintain 35 kV bus stability and ensure safe, reliable power system operation.

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Article Content

35kV bus voltage is abnormal

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Judgment and Treatment Method of 35 kV System Voltage Abnormity

(2) Abnormal bus voltage: the voltage above the knife switch of 35 kV bus voltage transformer is abnormal. It can be divided into resonance, single-phase grounding, phase failure and improper gear

A 35-kV system voltage sag improvement

Most of the 35-kV voltage drop, during a fault, occurs in the substation power transformer. The low voltage appears at the substation low side bus. This paper includes field test data that verify the

What are the causes of the breakdown and burning of the 35 kV GIS ...

Explore the detailed cause analysis and retrofit strategies for a 35kV GIS voltage transformer accident. Learn about design flaws, protection upgrades, and maintenance improvements to prevent failures

Analysis of an Explosion Accident of a 35 kV Voltage Transformer

Insulation aging in voltage transformers causes breakdowns and bus outages – common in grids. Strictly follow preventive test regulations, test/replace unqualified equipment.

Bus Protection Theory

These requirements are necessary to keep the level of error voltage as low as possible to prevent maloperation of the relay. Making modifications to an existing bus protection scheme, such as adding

Imbalance and Countermeasures Analysis on 35 kV Busbar Voltage of ...

For this issue,the imbalance of 35 kV busbar voltage at 110 kV Tongxiang substation is taken as an example to find out the line causing imbalance of busbar voltage by way of switching operation.

Analysis on a Resonance Faults Incident of 35kV Capacitor Voltage ...

In this paper, some of the suppressing circuits, series resonance type, parallel resonance type, and electronic type are reviewed. Specifications of these circuits and effects of various

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Analysis of Abnormal Partial Discharge of 35 kV XLPE

The partial discharge abnormality in 35 kV XLPE cables arises from the utilization of electric power equipment and its insulation materials. By aligning

Operational reliability assessment of power systems based on bus voltage

Abstract Bus voltage is a direct reliability indicator of a transmission network because it is related to system reactive and active power balance especially during a contingency state. This

VFD Undervoltage Fault

Comparing undervoltage trip thresholds with the nominal DC bus voltage we can see that the undervoltage trip settings for most drives is around 60% of nominal DC bus voltage.

Impedance-frequency characteristic curve of 35kV bus

Phase angle-frequency characteristic curve of 35kV bus. from publication: Research on High Harmonic Amplification of 10kV Series Static Var Generator | With the continuous development of power ...

Ferroresonance current simulation of 35 kV VT. HV: high voltage input ...

Download scientific diagram | Ferroresonance current simulation of 35 kV VT. HV: high voltage input; LV: low voltage output. from publication: Impact Transient Characteristics and Selection Method ...

35 kV bus voltage curves of six SVG

Download scientific diagram | 35 kV bus voltage curves of six SVG from publication: Voltage balance optimisation among subsystems of wind-photovoltaic-ES hybrid generating system | Hybrid, Balance ...

A 35-kV system voltage sag improvement

A comparison can be made between the voltage sag that occurs on a 12-kV and 35-kV system using system impedance and symmetrical component calculations. Most of the 35-kV voltage drop, during

35k Dist Standards 35KV manual all

For all metering installations (secondary, 15kV, 25kV, & 35kV), refer to Section AOJ in the APCO Company Specific Section of the Southern Company Overhead Distribution Standards.

Analysis on abnormal operation and structure of a 35 kV insulating ...

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In this study, a 35 kV insulating tubular bus bar in a substation was analyzed in terms of the structure design and the abnormal behaviours.

35kV Substation Electrical Design | PDF | Transformer

This document is a graduation thesis on the electrical primary design of a 35kV substation. It includes an abstract that outlines the design of a 35kV substation and its digital transformation. The document

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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