

35kV bus voltage is too low



Overview

What could cause the DC bus voltage on a drive to drop when the There are multiple possible causes for this situation, but one that should be ruled out fir.

Key Takeaways

A low 35kV bus voltage typically indicates a fault, load imbalance, or equipment issue, requiring immediate inspection and corrective action.

Common Causes of Low 35kV Bus Voltage

- **Grounding or Phase Faults:** Single-phase-to-ground faults, phase loss, or blown voltage transformer fuses can cause one or more phase voltages to drop significantly, while other phases may rise due to neutral displacement . In solid ground faults, the faulted phase voltage can drop to zero, triggering busbar grounding alarms.
- **Load Imbalance or Overload:** Excessive load downstream of the bus can reduce voltage levels. Sudden load changes or improper load distribution may cause the bus voltage to fall below nominal.
- **Equipment Malfunction:** Faulty voltage transformers (VTs), switchgear issues, or arc suppression coil problems can result in incorrect voltage readings or actual voltage drops .



- SCADA or Protection System Signals: Alarms from SCADA or relay systems may indicate low bus voltage due to detected neutral displacement or abnormal phase voltages .

Diagnostic Steps

- Check SCADA and Relay Alarms: Identify if the busbar grounding or low-voltage alarms are active. Review $3V_0$ voltage, arc suppression coil current, and small-current fault line selector status .
- Inspect Physical Equipment: Look for visible arcing, smoke, or unusual noises in the substation. Confirm the integrity of VTs, breakers, and bus connections .
- Measure Phase Voltages: Verify each phase-to-ground and line-to-line voltage to detect phase drops or imbalances. Compare with upstream and downstream voltages.
- Check Load Conditions: Ensure that downstream loads are within rated capacity and that no sudden load changes are causing voltage dips.

Corrective Actions

- Isolate Faulted Equipment: If a specific line or piece of equipment is identified as faulty, transfer its load and isolate it to prevent further voltage drop or damage .
- Trial Switching or Remote Tripping: Perform controlled switching to identify and clear faults, ensuring critical loads are notified before operation .
- Inspect and Maintain Switchgear: Confirm that 35kV switchgear insulation, breakers, and protection relays are functioning correctly and rated for the system's fault duty .
- Monitor and Adjust Load: Redistribute loads if necessary to balance the bus voltage and prevent recurrence of low-voltage conditions.

Safety Considerations

- Always notify central control and downstream users before switching operations.

- Ensure arc suppression coils and busbars are not overloaded to prevent overheating.

- Follow standard operating procedures for high-voltage equipment and maintain proper clearances and insulation ratings .

By systematically diagnosing faults, inspecting equipment, and managing loads, low 35kV bus voltage can be safely corrected while minimizing the risk of outages or equipment damage.

Article Content

Low and Medium Voltage Metal-Enclosed Cable Bus Guide

This specification describes the electrical and mechanical requirements for metal-enclosed, non-segregated phase

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