

The 35kV bus surge arrester burned out



AI Overview

A 35kV busbar surge arrester can burn out due to internal dielectric failure, thermal runaway of MOV elements, moisture ingress, or installation-related issues. Common Causes of Surge Arrester Failure

- 1. Thermal Runaway of MOVs:** Surge arresters use metal oxide varistors (MOVs) to divert overvoltages. Each surge generates heat in the MOV discs, and if the heat is not dissipated efficiently, it can cause thermal runaway, leading to cracking, melting, and complete failure of the arrester.
- 2. Moisture Ingress:** Water can penetrate the arrester housing through aged seals, cracks, or diaphragm defects. Temperature-induced pressure changes draw moisture inside, causing condensation that corrodes MOV discs and conductors. This increases resistive leakage current and can trigger internal breakdown.
- 3. Temporary Overvoltages (TOVs):** System events such as ground faults, switching surges, or unbalanced loads can create voltages above the arrester's rating. Sustained overvoltage forces the MOVs to conduct continuously, generating excessive heat and potentially causing flashover or dielectric failure.
- 4. Installation and Busbar Issues:** Poor installation, such as loose connections or improper conductor contact, can lead to overheating at busbar terminals, which may propagate to the surge arrester. In 35kV systems, even minor installation errors can compromise insulation and trigger arrester burnout.

Diagnostic Steps

- Visual Inspection:** Look for discoloration, bulging, or white powdery residues on the arrester or busbar, which indicate overheating or dielectric breakdown.
- Leakage Current Monitoring:** Measure resistive leakage current under normal voltage. A steady increase signals internal moisture or MOV degradation.
- Infrared Thermography:** Detect hot spots on the arrester or busbar to identify abnormal heating before catastrophic failure.
- Insulation Testing:** Use a megohmmeter to check busbar insulation resistance. Low readings indicate compromised insulation that may have contributed to arrester burnout.

Preventive...

Article Content

Medium voltage surge arresters

Hitachi Energy has 100+ years of experience in designing and manufacturing surge arresters for protection of electrical devices from all kind of overvoltages.

Analysis of Key Performance Indicators and Recommendations

In order to solve the problem of frequent failures of the EM surge arresters with a voltage level of ± 800 kV in UHV DC converter stations, it is necessary to systematically analyze the key

High-voltage surge arresters

Definition of surge arresters Surge arresters are used to protect high-voltage equipment in substations, such as transformers, circuit breakers, and bushings, against the effects of overvoltages caused by

Connecting made simple.

It is used for adapting an existing 600 A elbow to a 200 A tap or for different applications. It can be used for installing surge arrestors, testing or grounding 600 A systems. The Elbow Tap Plug (ETP) is fault

VariSTAR type AZG3 surge arresters for systems through 345 kV IEC

General Eaton's Cooper Power series VariSTARTM AZG3 Surge Arresters offer the latest in metal oxide varistor (MOV) technology for the economical protection of medium-voltage class power and

35kV R-Stack Surge Arrester

The Prysmian 35kV R-Stack Surge Arrester provides an easy-to-install and reliable means to protect medium voltage equipment and underground cable from voltage surges caused by lightning and

Simulation study on lightning protection of 35kV transmission line and ...

Abstract: In 35kV transmission lines, the intrusion of large-value lightning current often leads to short-circuit faults in the lines. In order to study the fault mechanism, this paper uses ATP-EMTP

System pattern of 35 kV bus and electrical monitoring

Download scientific diagram | System pattern of 35 kV bus and electrical monitoring signals from publication: Novel Method for Restraining 35kV Shunt Reactor

Case Studies in Condition Assessment of Substation Surge Arresters

Leakage current measurements based on THRC have proven a reliable and efficient methodology to assess the service condition of gapless metal oxide surge arresters, in accordance

High-voltage surge arresters

Some overvoltages are very high in energy. The current from the surge is diverted through the arrester, in most cases to earth. Effective over-voltage protection requires different surge arrester types to be

Surge Arresters Catalog

Surge Arresters Catalog MacLean Power Systems offers a full range of polymer housed surge arresters meeting the needs for transmission, substation, distribution and secondary surge protection. With

115-Kv Bus Switching Surges | IEEE Journals & Magazine

115-Kv Bus Switching Surges Abstract: In 1955, at the Black Dog Steam Station of Northern States Power Company (NSP), a 97-kv lightning arrester on the 115-2.4-kv reserve auxiliary

T-BODY ELBOW SURGE ARRESTERS

TE Connectivity's (TE) Raychem T-Body Elbow Surge Arresters ELB-35 are designed to protect underground cables and medium voltage apparatus from voltage surges due to lightning and

35kV R-Stack Surge Arrester | Prysmian

The Prysmian 35kV R-Stack Surge Arrester offers a reliable and easy-to-install solution for protecting medium-voltage equipment and underground cables from

Surge arresters

HE 60 surge arresters have been tested in compliance with the EN 50123-5 standard for surge arresters in DC networks for railways. Further tests have been carried out to examine the insulation withstand

Surge and lightning arresters | Megger

Figure 1: Typical surge arresters Whatever their application, surge arresters must be able to withstand the large amount of energy released by the current that flows in them when they are

How to Diagnose High Voltage Surge Arrester | Fluke

Surge arresters play a key role in protecting electrical devices and equipment in high-voltage electrical substations. Like other devices, they must be periodically diagnosed. The most common method is

NEMA Arresters » 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 in question. This table documents how well the arrester clamps

Surge Arrester and Substation Types

Abstract — Surge arresters are crucial devices that protect electrical systems from voltage spikes caused by lightning and transients. This paper categorizes them into three types: Distribution

Open Access proceedings Journal of Physics: Conference series

This paper analyzes a 220kV substation bus lightning arrester, collects fault recording information, points out the cause of the fault and puts forward corresponding preventive measures. Keywords: metal

5 Common Surge Arrester Failures and How to

This guide breaks down the five most common surge arrester failures, equipping you with the knowledge to diagnose issues early and prevent

Surge Arrester Failure: Causes, Lightning Effects, and Solutions

Surge arrester failure: Learn the causes and effects of lightning damage. Identify the reason arresters fail and find solutions for better protection.

Surge Protection of Substations

Altitude Surge performance of insulation at a substation is highly dependent on elevation since insulation withstand voltage reduces by ~11% with every 1000 m increase in altitude. Because

Impact of surge arrester number and placement on reliability and ...

On the other hand, surge arrester number and placement for high voltage substations can be determined based on some evaluations in the designing process of substations. Surge arresters

NEMA Arresters

Arresters are also classified by their application for use on distribution systems (Light Normal, Heavy duty) or in substations (Intermediate and Station). These types of arresters are generally used to

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