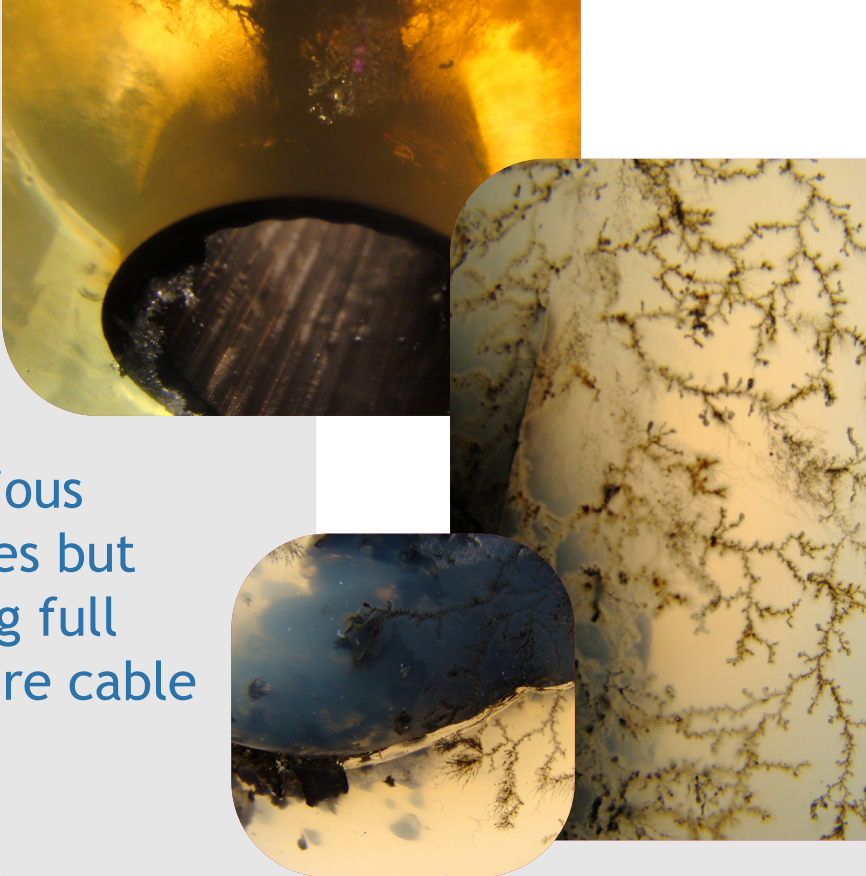




EXPLOSION IN SUBSTATION PROMPTS LIABILITY DISPUTE

Case Study



Investigation of an explosion in EHV substation uncovers serious workmanship deficiencies but stops short of supporting full replacement of the entire cable system, as claimed.

Two weeks following start-up of a newly constructed power plant in Northeast United States of America, that generated electricity at EHV level (Extra High Voltage) level, one of the termination bushings exploded, causing serious damage to the substation and adjacent electrical equipment, in addition to lengthy disruption to the power supply in the area.

Leading university laboratories concluded that the cause of the explosion was related to any of a number of issues with no clear identification of the exact root cause. Though the

Expert Involvement

After months of dispute between the utility company and the contractor, the matter was referred to court to look into the liability question and whether the owner was correct to replace the entire system and claim the cost from the contractor to avoid further damage and costly disruption to their operation.

Our expert was instructed to investigate the cause of the initial failure and establish whether PD existed, which would have warranted the replacement of the entire system. Investigation included reviewed of all design drawings, specifications and manufacturer calculations with regard to the entire cable system and the affected EHV busing to evaluate the design,

Bridging the Gap

During examination of different pieces of evidence the expert was able to identify serious deficiencies in the workmanship of the damaged bushing system. These deficiencies were responsible for induced electrical charges in the insulating stress cone used in the cable termination. These electrical charges in turn caused the gradual breakdown of the dielectric strength of the termination and the eventual catastrophic failure that caused the initial explosion.

The expert also confirmed that once the termination was replaced with a properly constructed replacement, there was no evidence of any partial discharge and the false positive

contractor replaced the failed bushing, the utility company insisted that additional testing and review of the entire substation and the cable system had to be conducted by a third party. Based on months of testing, the utility company replaced the entire cable system citing design deficiencies and made a liability claim against the contractor for the cost of the entire system. They provided a number of expert reports by various industry experts who identified PD (Partial Discharge) as the cause of the incident and alleged that PD continued to exist following repairs completed by the contractor.

as well as inspection of the scene of the loss and closely examined remains of the damaged bushing.

We witnessed several sessions of partial discharge testing during which third parties were instructed to test the system and determine the integrity of the design, and designed and supervised tear down of several other bushings from the same system to identify signs of PD and any other indication of system deficiencies.

To report our findings a detailed report was authored, and later we partook in a deposition to explain opinion with regard to the cause of the initial failure and the design integrity.

readings reported by the third party contractor who continued to test the system were misinterpreted. Therefore, the expert opined that there was no scientific justification to the utility company replacing the entire cable system.

The expert also provided clear evidence supporting his findings and refuting incomplete analysis conducted by other experts representing other parties. In his expert testimony, the expert prided detailed explanation of his opinions and concluded that the cable system was adequately designed and should not have been replaced.