

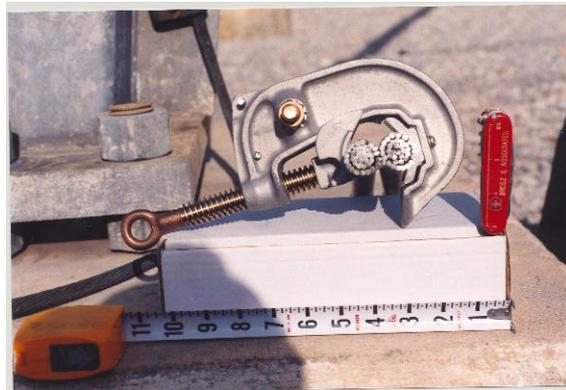
B&A

the forensic engineer

HIGH VOLTAGE REPAIR HAZARDS

Grounding and isolation of high voltage switches for repair are standard operating procedures. The sequence of switching, grounding and ungrounding to perform a repair job are logical and should normally be effective in both protecting the workers from electrical hazards and not affecting the substation operation. But what happens when something goes wrong?

A fully qualified substation mechanic was part of a three man crew assigned to repair a 230,000V switch in a substation. For unrelated reasons, one of the main transformers at the substation was out of service. In order to complete the repair without affecting the substation operation, one side of the switch had to remain energized throughout the repair. The other side had to be grounded by means of a portable ground clamp.



The sequence of operations involving grounding jumpers to disconnect the switch from the transmission line was completed successfully, the repair was done, and the sequence reversal began in order to reconnect the switch to the line. The operation sequence was successful for the first two pairs of jumpers, but while working on the third jumper, the grounding clamp separated from the jumpers, severely injuring the mechanic. An induced voltage of approximately 20000 volts AC was present. The mechanic suffered 2nd and 3rd degree burns to both hands and suffered both cardiac and respiratory failure. He was revived but sustains permanent disabling injuries.

Investigation by Brosz and Associates showed that the grounding clamp was defective in not providing specific instructions or limitations regarding the clamping of two parallel wires by one clamp. Since the use of multiple, closely spaced conductor bundles is common in the high voltage electrical transmission industry, it is common and foreseeable that a single clamp would be used to clamp more than one wire at a time.

The parties settled for an undisclosed amount.

BROSZ AND ASSOCIATES - FORENSIC SERVICES/LOSS CONTROL GROUP
Visit our website at www.brosz.net and view our photo and video library covering over 4900 cases over the last 35 years.