

the electrical digest

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PRODUCT LIABILITY AND FORENSIC ENGINEERING

Safety is a state of mind and the present overwhelming emphasis on safety devices seems to result in a "careless-tendency syndrome" where much is taken for granted. There is great reliance on these devices to the extent that people appear unconcerned about the consequences of their own and other peoples' action until something happens.

In a recent case, the supervisor of the testing department of a small motor rewind and repair company was electrocuted while setting up a 440VAC motor for test.

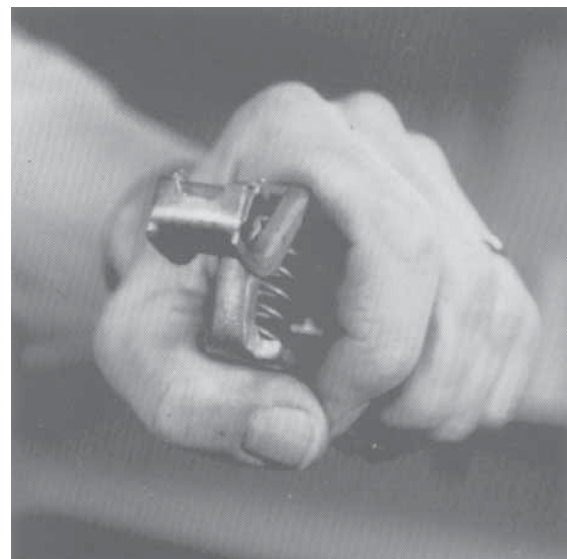
He had many years of experience in the industry and had recently enrolled in a trade school to further upgrade his skills, and yet he died.

The test bench was supplied by fused electrical disconnect switches which provided power at 110, 220 and 440 volts. Each box had a set of cables which terminated in "alligator" test clips protected by the usual plastic insulating "boots". The established procedure in setting up a test was to make sure the test leads were de-energized - switch off, door open and fuses out; make the connection to the equipment under test; replace fuses, close door and then turn the switch on.

No one knows for sure what happened, but the only other person in the shop at the time was an assistant. He heard a gasp and found the supervisor writhing on the floor still holding the test leads in his hands. The assistant turned the 440VAC switch off and watched the victim's hands and arms relax. The test leads fell to the floor. The supervisor died.



Victim's Hand



Simulated reconstruction of accident. Alligator clip exposed when insulating boot slipped back.

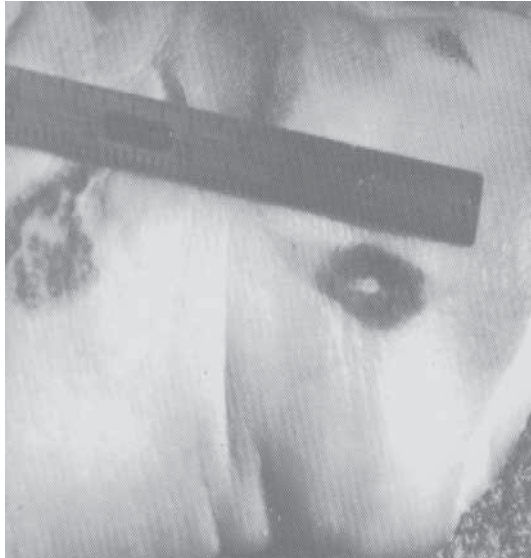


Simulated Burn Marks

The coroner's autopsy report included photographs of a burn mark on the palmar surface of the left thumb and index finger. An abrasion on the back of the right hand was described but not photographed. The Plaintiff (victim's estate) alleged that the insulating boots protecting the alligator clips were defective and resulted in his electrocution.

BROSZ & ASSOCIATES were called in as an expert witness to investigate the nature of the accident and to determine whether or not the insulating boots could have been faulty. The test leads and insulating boots had vanished shortly after the accident before anyone could examine them.

Our first task was to try and duplicate the burn pattern on the victim's hand. This was done by applying various voltages and currents for varying times to an insulated test clip pressed against a suitable piece of animal tissue.



Various animal-tissue burns

The tests were repeated with the insulating boots artificially damaged in various modes to represent the alleged penetration of a few strands of wire, and also with several sizes and shapes of cuts and tears. In each case the burn pattern was restricted to the size and shape of the cut and tear. The conclusion drawn from the animal tissue electrocution test results was that the shape of an electrical burn mark takes on the size and shape of the object in contact with the skin, just as a branding iron would. These tests also indicated that the insulating boot performed well, even when damaged.

The burn marks on the victim's hand indicated that he had made direct metallic contact with the test clips and not through an allegedly defective insulating boot. He was thus the architect of his own misfortune, as submitted in our pre-trial deposition, and not the victim of a faulty product. The Plaintiff's claim demands immediately reduced to a few hundred thousand dollars and after one day into the trial, settled for a small amount out of court.