

Case 217. 38-year-old floor technician died of a probable electrocution when he contacted a return water pipe attached to a boom for a glass melting electrode.

A 38-year-old male floor technician died of a probable electrocution when he contacted a return water pipe attached to a boom for a glass melting electrode. He and a coworker were preparing to reposition the boom for the glass-melting electrode. The boom vertical stand was outside of the glass melter unit. The horizontal boom and its electrode extended into the glass melter. At the top of the glass melter was a spreader unit for the sand to be added to the melter. The spreader unit had a chute; the chute had become entangled in the electrode hoses. The electrode was insulated from the boom framework. The boom was insulated from the boom stand. The boom consisted of a 3-inch diameter water-cooled copper tube conductor, which was positioned between two sections of the boom frame work. This was connected to 110-volt power cable and flexible hose lines. The water traveled through this tube to the tail of the end portion of the electrode and water returned through a 3/4-inch pipe attached to the outside of the boom framework. The power cable was attached via a metal clamp to the 3-inch tube. A canvas sleeve covered portions of the top and sides of the clamp/cable. The 3/4-inch pipe was positioned five to six inches away from the clamp/cable and separated from the 3-inch tube by dielectric spacers. The boom framework was still conductive. The decedent was wearing a hi-temperature gloves composed of Kevlar/glass/Nomex material. To reposition the boom, the decedent was to hold onto the return water pipe which was connected to the boom, while his coworker removed a pin at the base of the boom stand. The decedent would then appropriately position the boom and his coworker would reinsert the pin. While standing on ceramic brick, the decedent held the 3/4-inch pipe while his coworker knelt down to remove the pin. The decedent held onto the pipe but it was not confirmed that he contacted the tube or clamp. As his coworker was kneeling, the decedent called out to him. When his coworker looked up, he saw the decedent staring into the glass melter. The decedent's left hand was on the water return pipe and his right hand released from the pipe. Not finding a safe piece of equipment to disengage the decedent's left hand, his coworker pulled him from the pipe to the floor by grasping his right hand. The coworker initiated a "code red" and he and another employee performed CPR until emergency response arrived. A burn mark was detected on the decedent's right glove. No definitive electrical burns were found on the decedent's hands or body upon autopsy. The company measured the voltage and amperage on the copper tube/clamp and measured 87.3 volts and non-detectable amperage. MIOSHA found no absolute confirmation that there was hazardous energy in the spots where he was in contact with the water return pipe at the time of the incident. Per the medical examiner: "Low-voltage electrocutions do not result in burns in a significant percentage of cases. In the absence of burns the diagnosis of death due to electrocution is dependent largely on the investigation. In this case, the investigation apparently did reveal a source of electricity (per MIOSHA) and the circumstances make it likely that an electrocution occurred."

MIOSHA General Industry Safety and Health Division personnel issued the following Serious citation:

SERIOUS: DESIGN SAFETY STANDARDS FOR ELECTRICAL SYSTEMS, PART 39,
RULE 1910.303(g)(2)(i):

Live parts of electric equipment operating at 50 volts or more was not guarded against accidental contact by use of approved cabinets or other forms of approved enclosures or by any of the means listed in 1910.303(g)(2)(i)(A) to (b) of Part 39.

No guard and inadequate guard over exposed live parts, 110-volt conductors for a melter electrode within inches of a technician's hands during an adjustment, electrode(s) for melters