Case 180. 54-year-old journeyman electrician died of burn complications sustained in an arc flash while checking the fuse clips in a 480-volt distribution panel.

54-year-old male journeyman electrician died of burn complications sustained in an arc flash while checking the fuse in a 480-volt distribution panel that supplied power to a lighting transformer. The distribution panel was approximately 3-1/2 feet wide and 5 feet tall. The panel had six buckets, three on each side of the panel front. Each bucket had an individual hinged door with a disconnect. Within each bucket were three horizontal cartridge fuses, which were held in place with spring fuse holder clips located on each end of the fuse. A thermal image photo showed that an area in one of the buckets was overheating. The decedent had opened the door to this bucket via the disconnect to check the clips and lugs. He removed the three clips for the 100-amp fuses. It is unknown if the decedent tested for power after he opened the bucket door. The supervisor arrived at the incident site. He stated that the decedent indicated that he was going to change the fuses and that the fuse clips didn't need changing because they were tight. The supervisor stood to the right of the decedent. The decedent stuck his screwdriver into the top fuse clip on the right side of the opening and spread the clip to show his supervisor that the clip did not need to be changed. The supervisor stated that the decedent pulled his screwdriver out to move down to the next clip and the panel exploded. Both the supervisor and the decedent sustained burn injuries. The decedent died four weeks later from the third degree burn injuries sustained at the time of the incident. When the disconnect for the bucket was turned "off", the bucket was supposed to be de-energized. A service disconnect circuit breaker was located on a mezzanine platform that supplied the panel where the arc blast occurred. After the blast, the disconnect on this service panel had to be manually opened to shut down the power to the panel. It is unknown if the decedent was using an insulted screwdriver.

MIOSHA General Industry Safety and Health Division issued the following alleged Serious citations at the conclusion of its investigation.

SERIOUS: ELECTRICAL SAFETY-RELATED WORK PRACTICES, PART 40.

- RULE 4002(2): Insure that exposed employees are trained in and familiar with the safety-related work practices that pertain to their respective job assignments as specified in rule 4002(3) to 4002(7).

  No training on when lockout is required and when electrical Personal Protective Equipment is required.

- RULE 4002(2): Insure that while any employee is exposed to contact with parts of fixed electrical equipment or circuits, which have been de-energized, the circuits energizing the parts shall be locked out in accordance with the requirements of this rule.

  Not locking out 480-volt electrical circuit while checking condition of fuse holding clips on panel.

- RULE 4004(9): The requirements of this rule shall be met before any circuits or equipment can be considered to be de-energized and before any circuits or equipment can be worked on. A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted. A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induce voltage or unrelated voltage backfeed, even thought specific pars of the circuit have been de-energized and presumed to be safe.

  Not treating 480-volt circuit as energized prior to testing, disconnect in off position, no Personal Protective Equipment or insulated screwdrivers.

- RULE 4005(2): Only qualified persons may work on electric circuit parts or equipment that have not been de-energized under the procedures specified in R 408.14004. Such persons shall be trained to work safely on energized circuits and shall be familiar with the proper use of all the following: (a) Special precautionary techniques. (b) Personal Protective Equipment. (c) Insulating and shielding materials. (d) Insulating tools. (e) Testing equipment.

  Employee not trained in special precautionary techniques, electrical Personal Protective Equipment, insulating tools or testing equipment.

- RULE, 4009(1): An employee who works in an area where there are recognized electrical hazards shall be provide with, and shall use, electrical protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed. The appropriateness of the protective equipment shall be determined pursuant to the provisions of general industry safety standard, Part 33, Personal Protective Equipment, being R 408.13301 et seq. of the Michigan Administrative Code.

  No electrical personal protective equipment available or used prior to verifying de-energized status of 480-volt circuit to be worked on.