

Case 115. 34-year-old journeyman electrician was fatally electrocuted when he contacted bus bars energized to 7,200 Kvs while walking on the steel structure of a new, non-energized electrical substation.

A 34-year-old male journeyman electrician was fatally electrocuted when he contacted bus bars energized to 7,200 Kvs while walking on the steel structure of a new, non-energized electrical substation. The decedent was a member of a 3-person crew that was wiring a new electrical substation. The decedent was responsible for wiring the AC panel and his coworkers were working on the main transformer approximately 15 feet away.

After lunch, the decedent was directed to run the transformer drops. The decedent asked the supervisor if he should check the substation's security lights so the crew would not have to check them the next day in the dark. His supervisor agreed, and directed the decedent to take a ladder and tape off the security lights' photocells so that the lights would come on during the daylight. The decedent's two coworkers returned to the main transformer to continue its wiring. The decedent went to the electrical panel and ran the secondary leads from the AC power transformer to the top of the panel. He then took a short extension cord (pig tail) and wired the (red) hot wire into the secondary lead from the station AC power transformer. The decedent then wired the neutral (white) into the circuit for lighting and then connected the plug end of the pigtail into an extension cord from the work trailer on site. At this point, the panel became energized and back fed 110 volts through the transformer, which boosted the voltage to 7,200 Kv. The decedent climbed a ladder to cover the photocells on one corner of the structure. Instead of climbing down the ladder and moving the ladder to another light location, he climbed across the structure to another corner to cover the light in this location. The decedent contacted an energized bus bar and fell 15 feet to the ground. His coworkers heard him yell and found him on the ground. One of his coworkers initiated CPR while the supervisor ran to the road via the substation's hidden driveway to get a signal so he could call 911. Emergency personnel arrived and he was declared dead at the scene.

MIOSHA Construction Safety and Health Division issued the following alleged Serious citations:

- ACT 154 PUBLIC ACT OF 1974, 408.1011(a).
Employer should furnish to each employee, employment and a place of employment which is free from recognized hazards that are causing, or are likely to cause, death or serious physical harm to the employee.

Employer failed to protect the employee from the hazard of energized equipment at sub-station. Employee ran transformer drops into the top of service panel, then wired extension cord pigtail into transformer leads and circuit for security lights. Employee plugged pigtail into extension cord energizing panel and back feeding 110 volts through transformer—boosting the voltage to 7,200 Kv. The employee climbed a ladder to check lighting on the southeast corner of the structure and then climbed across structure to the northwest corner. Employee contacted energized bus bar and fell 15 feet to the ground.

A feasible method of abatement of hazard, among others, would be to develop a lock-out program and a written procedure using standard industry practice that would safeguard employees from energized equipment when installing wiring into AC service panel to check security lighting and equipment at substation.

- GENERAL RULES, PART 1, RULE 114(2)(d).
An accident prevention program shall, as a minimum, provide for the following: Instruction to each employee in the recognition and avoidance of hazards and the regulations applicable to his or her work environment to control or eliminate any hazards or other exposure to illness or injury.

No instruction to employee in the recognition and avoidance of hazard applicable to his work environment at Substation.

- POWER TRANSMISSION AND DISTRIBUTION, PART 16, RULE 1634(1).
A lineman's belt and safety strap shall be provided and as prescribed in Construction Safety Standard, Part 6, Personal Protective Equipment, being R40840601 et seq. of the Michigan Administration Code, and shall be worn by an employee working on a pole, tower, or such structure, except where use of the belt and strap created a greater hazard. If use of the belt and strap creates a greater hazard other equivalent safeguard shall be used.

No rope grab attached to lifeline used as a means of fall protection when walking across substation structure 15 feet above the ground.

- POWER AND TRANSMISSION AND DISTRIBUTION, PART 16, RULE 1626(1)
Existing conditions shall be determined before starting work by an inspection or a test. Such conditions shall include, but not be limited to, energized lines and equipment, conditions of poles, and the location of circuits and equipment, including power and communication lines, CATV, and fire alarm circuits.

No inspection of equipment was made to determine existing conditions prior to energizing AC service panel.

- POWER AND TRANSMISSION AND DISTRIBUTION, PART 16, RULE 1627 (1)(a)
An employee shall not be permitted to approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in table 1 unless the following is complied with:
 - (i) The employee is insulated or guarded from the energized part. Gloves or gloves with sleeves rated for the voltage involved, which are provided for pursuant to rules 617 and 641 of Construction Safety Standard, Part 6, Personal Protective Equipment, being R408.41617 and R408.40641 of the Michigan Administrative Code, shall be

considered insulation of the employee from the energized part. The work method on parts energized above 5,000 volts phase to ground shall be with rubber gloves and sleeves out of an insulated bucket, by the use of hot line tools, or with rubber gloves and sleeves in conjunction with a factory-made and approved insulated platform that provides a method of belting off other than to the pole or structure. This rule does not apply to the bare-hand technique.

- (ii) The energized part is insulated or guarded from the employee and any other conductive object at a different potential.
- (iii) The employee is isolated, insulated, or guarded from any other conductive object, as during live-line, bare-hand work.

Employee failed to maintain a minimum clearance of 2 feet when approaching energized bus bar.