



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Electrical Project Supervisor Dies After Contacting An Energized Conductor—South Carolina

FACE 92-20

SUMMARY

A 46-year-old electrical project supervisor (the victim) died at a plastic bottle packaging plant when he contacted an energized conductor inside a control panel. Before the incident occurred, the victim had installed a compressor motor starter inside a control panel and the associated wiring from the control panel to the main distribution panel. To check the starter's operation, the switch on the main distribution panel was turned to the "on" position, energizing the components inside the starter control panel. The starter indicator light activated, but the compressor motor did not start. The victim concluded that a problem existed inside the starter control panel, and he directed a co-worker to retrieve a voltmeter so he could check the continuity of the starter control panel wiring. In the interim, the victim, without de-energizing the unit, opened the starter control panel door and reached inside to trace the wiring and check the integrity of the electrical leads. In doing so, he contacted the 480-volt primary lead for the motor starter with his left hand. Current passed through the victim's left hand and exited through his feet to ground, electrocuting him. NIOSH investigators concluded that, to prevent future similar occurrences, employers should:

- **stress and reinforce the importance of following established safe work procedures, with particular emphasis on de-energizing electrical systems before any work is performed**
- **routinely conduct scheduled and unscheduled worksite safety inspections**
- **encourage workers to actively participate in workplace safety.**

INTRODUCTION

On May 16, 1992, a 46-year-old male electrical project supervisor (the victim) died when he contacted an energized conductor inside a control panel. On May 20, 1992, officials of the South Carolina Occupational Safety and Health Administration (SCOSHA) notified the Division of Safety Research (DSR) of this fatality and requested technical assistance. On July 1, 1992, a safety specialist from DSR conducted an investigation of this incident. The investigator reviewed the incident with the president/CEO of the company, the SCOSHA compliance officer assigned to the case, and the coroner in the county where the incident occurred. Photographs taken of the incident site were obtained from local sources.

The employer was an industrial electrical contracting company that had been in operation for 10 years. The company employed 20 workers, including 3 electrical project supervisors. The company's written safety program, administered by the president/CEO and the project supervisors, included disciplinary procedures specifying that three reprimands would result in termination. The safety program mandated pre-employment drug screening and on-the-job random drug testing. The president/CEO served as safety officer on a collateral duty basis, and the supervisors held monthly safety meetings with all crew members. The victim had worked for this employer for 5 years and 3 months as a project supervisor, and had approximately 27 years of electrical experience. The company and victim had been working at the packaging plant for 6 months before the incident; this was the company's first fatality.

INVESTIGATION

The company had been contracted to install two control cabinets, conduit, wiring, and two solid-state compressor motor starters for two 400-horsepower air compressors used to supply air to plastic bottle blow mold machines. On the day of the incident, the victim and three co-workers (one electrician and two helpers) arrived at the plant at 7 a.m. They were scheduled to install the last starter and to complete the wiring from the compressor motor to the starter in the control panel, and from the starter control panel to the main distribution panel. Once installation was completed, they were to check the operation of the unit.

At approximately 3:15 p.m., the starter had been installed and all associated wiring had been completed. The victim directed a helper to turn the switch to the "on" position at the main distribution panel, approximately 6 feet away, to check the starter's operation. The helper turned the switch to the "on" position, energizing the components inside the starter control panel. The victim pushed the starter "start" button, and the starter indicator light activated, but the compressor motor did not start. When the compressor motor did not engage, the victim concluded that a problem existed inside the starter control panel. The victim directed the electrician to retrieve a voltmeter so that he could check the continuity of the wiring inside the starter control panel. In the interim, the victim opened the starter control panel door without de-energizing the unit and reached inside to trace the wiring and check the integrity of the electrical leads. In doing so, he contacted the 480-volt primary lead for the motor starter with his left hand. Current passed through the victim's left hand and body and exited through his feet to the ground. The victim yelled, and the helper immediately turned the main distribution switch to the "off" position as the victim collapsed to the floor. A plant maintenance supervisor walking by the area saw the event and called the emergency medical service (EMS). The helper checked the victim and immediately administered cardiopulmonary resuscitation (CPR). The EMS arrived in 10 to 15 minutes, continued CPR, and transported the victim to the local hospital where he was pronounced dead 1 hour and 20 minutes after the incident occurred.

CAUSE OF DEATH

The county coroner reported the cause of death as cardiac arrest due to electrical shock.

RECOMMENDATIONS/DISCUSSION:

Recommendation #1: Employers should stress and reinforce the importance of following established safe work procedures, with particular emphasis on de-energizing electrical systems before any work is performed.

Discussion: Although the circuits had to remain energized during testing of the starter, it was not necessary to leave the circuits energized while tracing and checking the integrity of the electrical leads. In spite of company safe work procedures, and as required by 29 CFR 1926.416(a)(1), the circuits were not de-energized within the control panel. For these procedures to be effective, they must be clearly communicated and fully understood by the affected employees and supervisors. The employees and supervisors must believe the company genuinely expects compliance with the guidelines.

Recommendation #2: Employers should routinely conduct scheduled and unscheduled worksite safety inspections.

Discussion: Scheduled and unscheduled safety inspections should be conducted by competent individuals. No matter how comprehensive, a safety program cannot be effective unless implemented in the workplace. Although these inspections do not guarantee the elimination of occupational injury, they do demonstrate the employer's commitment to the enforcement of the safety program.

Recommendation #3: Employers should encourage workers to actively participate in workplace safety.

Discussion: In this incident, the victim, an electrical project supervisor with 27 years of electrical experience, accessed an energized control panel in violation of established safety rules. Employers must instruct workers of their responsibility to participate in making the workplace safer, and ensure that all workers understand the role they play in the prevention of occupational injury. Increased worker participation will aid in the prevention of occupational injury.

REFERENCES

Office of the Federal Register: Code of Federal Regulations, Labor 29 Part 1926. p. 162. July 1, 1989.

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Last Reviewed: November 18, 2015

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