



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Truck Driver Dies When Crane Boom Contacts Powerline

FACE 89-48

Introduction

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatal Accident Circumstances and Epidemiology (FACE) investigations when a participating state reports an occupational fatality and requests technical assistance. The goal of these evaluations is to prevent fatal work injuries in the future by studying the working environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

On August 22, 1989 a 43-year-old male truck driver died when the boom of the truck mounted crane he was operating contacted a 14,400-volt overhead powerline.

Contacts/Activities

State officials notified DSR of this fatality and requested technical assistance. Prior to the investigation, DSR personnel reviewed this case with state officials. On September 19, a DSR safety specialist and an epidemiologist conducted an investigation of this incident. They met with local officials and company representatives, and visited and photographed the incident site.

Overview of Employer's Safety Program

The employer is a large building materials supply company. The company has been in operation for more than 80 years and presently employs 1,726 individuals. The victim was one of 52 drivers who deliver concrete products. The company has a full-time safety officer, a written safety policy, and a procedures manual which includes safety information. Both formal and on-the-job training are provided to all employees. The victim had been employed by the company for 5 1/2 years. During the first 2 1/2 years he worked as a dump truck driver. For the past 3 years he worked as a concrete products delivery truck driver.

Synopsis of Events

On the morning of the incident, the victim began work at 8:00 a.m. He made one delivery and returned to the concrete block plant for a second load. He left the plant at 11:05 a.m., and drove to a construction site where a new church was being erected. The concrete blocks were to be used for the foundation of the church building. The victim had delivered an identical load to the same location the previous day.

The victim unloaded blocks on three sides of the building site, and then moved the crane truck to the fourth side of the site to unload the last pallet of blocks. A driveway ran parallel to the new building at this location. Also parallel to the new building, but across the driveway, ran an overhead powerline. On the building side of the driveway another powerline ran to a security light at the rear of the property. (See [Figure](#)). The victim positioned his truck in the driveway between these lines and lowered the outriggers of the truck to stabilize it. Then, standing at the rear of the truck the victim began to raise the crane boom to a vertical position using a remote control device attached to the truck by a 15-foot-long umbilical cord. As the boom crane was raised, it contacted the uppermost wire of the powerlines across the driveway from the building site. When the boom contacted this energized 14,400-volt line, the truck-mounted crane, the umbilical cord, and the remote control device became energized. A "path to ground" was established through the victim's body, entering his hands (holding the remote control device) and exiting his feet to ground. The victim collapsed clutching the remote control device to his chest. By the time the automatic disconnect device in the powerline deenergized the circuit, the victim had received massive electrical burns over most of his body.

Construction workers in the area reported hearing an "arcing" sound and observed the victim lying on the ground and the tires of the truck on fire. One of the workers called the local emergency services, including fire, rescue, and police personnel, along with employees of the electric utility company, who responded to the scene within minutes of the incident. The fire department extinguished the fire. The victim was pronounced dead at the scene by the assistant medical examiner.

Cause of Death

The medical examiner gave the cause of death as electrocution.

Recommendations/Discussion

Recommendation #1: In accordance with current OSHA regulations, cranes should not be operated within 10 feet of energized powerlines.

Discussion: Existing OSHA standards (29CFR 1926.550(a)(15)) prohibit the operation of a crane within 10 feet of overhead electrical distribution and transmission lines except where those lines have been deenergized and visibly grounded. This standard also requires that a person be designated to act as observer when it is difficult for the operator to maintain the required clearance by visual means. Had these requirements been followed this fatality could have been prevented.

Recommendation #2: Consideration should be given to adaptation of electrically isolated remote control systems.

Discussion: The remote control system used on this crane was electrically connected to the crane. This system provided the "path to ground" which resulted in this fatality. A remote control system which is electrically isolated from the crane would provide protection to a crane operator if contact with an energized overhead powerline occurs. Electrical isolation could be accomplished by radio controls, fuse equipped control lines, fiber optic controls, insulated control boxes, etc. Manufacturers of crane systems should evaluate these options and incorporate an electrically isolated remote control system in the design of newly manufactured truck-mounted cranes. Manufacturers and their customers should cooperate in an effort to retrofit existing truck-mounted cranes with these systems, as well.

Recommendation #3: Boomed vehicle drivers/operators should be trained in the safe operation of these vehicles.

Discussion: The victim in the incident had received no formal training in the hazards associated with boomed vehicle operations. At minimum, such training should address:

1. all OSHA standards applicable to cranes

2. recognition of hazards associated with loading/unloading of materials

3. selection of sites for offloading materials that are level and firm, and located away from overhead powerlines

4. proper use of outriggers in accordance with the manufacturer's guidance

5. use of established procedures in emergency situations [Example – In the event of contact with an electrical powerline, never contact a vehicle or allow anyone else to contact a vehicle, and keep all unauthorized personnel away from the area.]

Recommendation #4: When circumstances are such that no alternative to operating a crane in close proximity to a powerline exists, the local utility company should be contacted to de-energize or insulate the powerlines prior to the start of work.

Discussion: De-energizing or insulating powerlines in a work area serves to provide a measure of protection to crane operators should contact with powerlines occur. While obvious drawbacks exist to pursuing this course of action (time involved to get utility company personnel to the scene, disruption of customer service, etc.) in cases where no alternative to operating a crane near a powerline exist, this procedure does provide a viable option which could prevent injuries or fatalities.

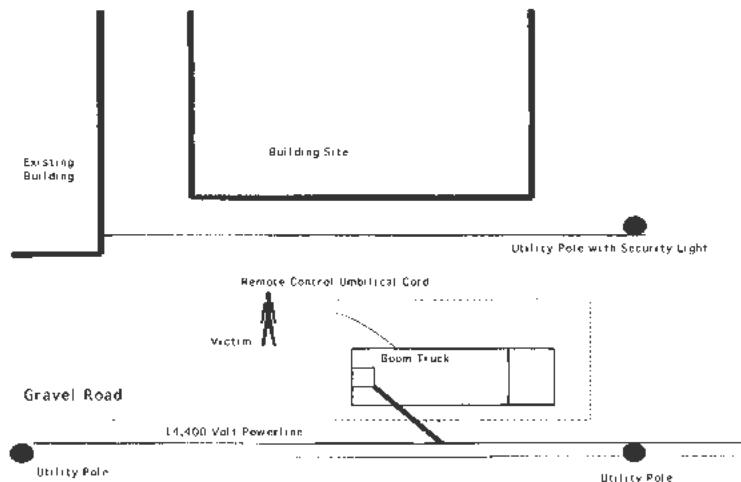


Figure.

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