


Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

REPORT#: 18KY024

REPORT DATE: 11-12-18

INCIDENT HIGHLIGHTS

 **DATE:**
06/22/2018

 **TIME:**
4:35pm

 **VICTIM:**
61-year old dump truck driver

 **INDUSTRY/NAICS CODE:**
Construction 238

 **EMPLOYER:**
Owner-Operator

 **SAFETY & TRAINING:**
None

 **SCENE:**
Construction site

 **LOCATION:**
Kentucky

 **EVENT TYPE:**
Electrocution

Dump Truck Operator Electrocuted After Truck Bed Contacts High Voltage Line

SUMMARY

On June 22, 2018, a 61-year-old dump truck owner-operator was transporting crushed rock to fill a sinkhole, when he raised the bed of the dump truck and contacted high voltage power lines, resulting in a rear tire catching fire. As the dump truck operator attempted to exit the vehicle, he stepped off the metal running board while holding onto the side of the truck, and was electrocuted.

[READ THE FULL REPORT>](#) (p4.)

CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Lack of hazard awareness
- Exiting the vehicle while in contact with high voltage lines
- Fire
- Elevated terrain

[LEARN MORE>](#) (p.4)

RECOMMENDATIONS

FACE investigators concluded that, to help prevent similar occurrences, employers should:

- Perform a hazard assessment prior to beginning work to be aware of the hazards in the immediate work area.
- Require drivers to have a spotter when working around electrical lines.
- Have motor vehicles working on site maintain a safe working distance from high voltage lines.
- Stay in the vehicle and call 911.

<http://www.mc.uky.edu/kiprc/face/index.html>





KENTUCKY

State **FACE** Program

Fatality Assessment & Control Evaluation

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Fatality Assessment and Control Evaluation (FACE) Program

This case report was developed to draw the attention of employers and employees to a serious safety hazard and is based on preliminary data only. This publication does not represent final determinations regarding the nature of the incident, cause of the injury, or fault of employer, employee, or any party involved.

This case report was developed by the Kentucky Fatality Assessment and Control Evaluation (FACE) Program. Kentucky FACE is a NIOSH-funded occupational fatality surveillance program with the goal of preventing fatal work injuries by studying the worker, the work environment, and the role of management, engineering, and behavioral changes in preventing future injuries. The FACE program is located in the Kentucky Injury Prevention and Research Center (KIPRC). KIPRC is a bona fide agent for the Kentucky Department for Public Health.

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INTRODUCTION

At 4:35 PM, on Friday, June 22, 2018, a dump truck driver was electrocuted when he stepped off the vehicle's running board while the raised truck bed was in contact with a high voltage power line. On June 22, 2018, the Kentucky Fatality Assessment and Control Evaluation Program was informed by the Kentucky Labor Cabinet of the incident. A site visit and investigation were subsequently conducted.

EMPLOYER

- The prime employer, a commercial construction company in business since June 2003, had two employees on-site at the time of the incident.
- The victim, who had been contracted by the prime employer to clear the area of building demolition debris, was the owner-operator of a dump truck, and had been self-employed since 1985. The victim's company consisted of only two employees, himself and his brother-in-law, both of whom were on-site the day of the incident.

WRITTEN SAFETY PROGRAMS and TRAINING

At the time of the incident, the company consisted of only two employees: the victim and his brother-in-law. As a result, there were no written or verbal safety or training programs. The two men relied on their years of experience in the field to maintain their safety.

WORKER INFORMATION

The victim was a 61-year-old married father. Prior to becoming a dump truck owner-operator in 1985, the victim had previously worked in the construction industry.

INCIDENT SCENE

The incident took place on a construction site on which a set of townhouses had recently been demolished. Because of the amount of debris and displaced soil, a pile of rubble measuring three feet in height was present. Due to the saturated ground and the weight of the vehicle, the victim would often drive his dump truck onto the pile of rubble while performing his responsibilities. With the buildup of debris and the truck bed extended the full 24 feet, the top of the truck bed measured 27 feet from the ground. The overhead power lines that the dump truck contacted measured 24'9" from the ground because of the buildup of debris.

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Photo 1: Incident site. Photo property of KY FACE.



Photo 2: Overhead view of the worksite. All townhouses featured in photo were demolished at the time of the incident.
Photo courtesy of Google Maps.



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WEATHER

The temperature was 79 degrees Fahrenheit at the time of the incident. Wind was south 13.8 mph and overcast. Weather is not considered a factor in this incident¹.

INVESTIGATION

On Friday, June 22, 2018 at 8:00 am, the victim and his brother-in-law arrived at a construction site to begin work. The 20-acre parcel of land had recently been purchased by a real estate development company with the intention of razing the area of all pre-existing structures and constructing up to 77 single-family houses. The townhouses on the land had recently been demolished, and the primary construction company subcontracted the victim to help clear the area of the debris. The victim's job was to transport large pieces of concrete debris in his 1980 Ford L9000 2-axle dump truck to a rock crusher that was designed to reduce the rock to pieces of gravel. After the rock was pulverized, the victim would then take the load of smaller rock to a sink hole located near a tree where he would raise the truck's bed and dump the gravel.

At approximately 4:35 pm, as the victim was raising the truck's bed, he slowly backed up to dump a load of large concrete debris into the rock crusher. As the bed of the truck extended to its full raised height of 24 feet above the ground, it made contact with overhead electrical lines carrying 7,200 volts. This caused electricity to travel through the vehicle and catch the back tires of the truck on fire. Realizing the truck was on fire, the victim honked the horn to attract the attention of his brother-in-law who was getting a drink of water. The brother-in-law saw that the truck's tire had begun burning, and ran towards the truck. The driver, after getting his co-worker's attention, attempted to exit the vehicle in order to escape the flames. The victim opened the door, stepped onto the metal running board with his hand on the exterior of the truck, stepped off with one foot, and contacted the ground. Due to being in contact with both the ground and the electrified dump truck, the victim became grounded, completed the circuit, and was immediately electrocuted. The victim's co-worker and employees from the primary construction company were able to pull him away and doused him with a fire extinguisher to put out the flames on his body. The victim sustained charred electrical burns as well as thermal burns caused by his blue jeans catching on fire. The electrical current entered and exited his feet and hands.

The Public Service Commission investigated the scene and checked the height of the overhead power lines. They determined the power line that was contacted was found to meet or exceed the required clearance of 26 feet from the original elevation, and the raised elevation of the site caused by debris allowed the bed of the truck to reach the high voltage wires at 24'9".

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Photo 3: Dump truck while burning.
Photo property of KY FACE.



Photo 4: Dump truck post-fire.
Photo property of KY FACE

CAUSE OF DEATH

According to the death certificate, the cause of death was electrocution.

CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. NIOSH investigators identified the following unrecognized hazards as key contributing factors in this incident:

- Lack of hazard awareness
- Exiting the vehicle while in contact with high voltage lines
- Fire
- Elevated terrain

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Perform a hazard assessment prior to beginning work to be aware of the hazards in the immediate work area.

Discussion: Prior to commencing work, employers should perform a hazard analysis in order to determine what possible dangers are present and possible resolutions. OSHA described a hazard analysis as “a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. Ideally, after you identify uncontrolled hazards, you will take steps to eliminate or reduce them to an acceptable risk level².” If a hazard analysis had been performed, it is likely that the overhead power lines would have been identified as a hazard of the task due to the elevated terrain, and measures could have been taken to reduce the danger.

Recommendation #2: Require drivers to have a spotter when working around electrical lines.

Discussion: In an interview with the victim’s coworker, it was determined that the dump truck the victim was driving did not have a back-up alarm, and due to the dump truck’s design, could not see what was directly behind or above the vehicle. According to CFR 1926.601(b)(4)(ii)³, No employer shall use any motor vehicle equipment having an obstructed view to the rear unless “The vehicle is backed up only when an observer signals that it is safe to do so.” Spotters should be a safe distance from the vehicle, have a set of pre-determined signals that can be communicated to the driver, and instruct the driver to stop immediately if they lose sight of the spotter. Had the victim used a spotter to help guide him while the dump truck was travelling in reverse, it is likely that the spotter would have observed the truck’s bed getting close to the overhead power lines, and could have instructed the driver to stop before contacting them.

Recommendation #3: Have motor vehicles working on site maintain a safe working distance from high voltage lines.

Discussion: Before beginning work near high voltage wires, it should have been determined how many volts the overhead lines were carrying in order to implement plans to keep any large equipment a safe distance away. According to CFR 1926.1408(c), “...the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer’s request.” The overhead power line that the dump truck contacted was carrying 7.2 kilovolts (7,200 volts). According to ‘Table A – Minimum Clearance Distance’ found in CFR 1926.1409, the minimum safe distance the dump truck should have been from the power lines at that voltage was 10 feet.

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TABLE A—MINIMUM CLEARANCE DISTANCES ^[4]

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

As a conductor of electricity gets close to a power line, especially those carrying high voltage, the electricity can ‘jump’, or arc, to the conductor. This happens when the voltage gradient (volts per meter) is sufficiently high, which can ionize gas molecules by ripping an outer electron off an atom and accelerating it. At higher voltages, electricity can arc further distances to the nearest conductor. If the voltage information had been determined, and a plan put in place to keep large equipment a safe distance from the power lines, it is likely the dump truck would never have contacted the power lines.

Recommendation #4: Stay in the vehicle and call 911.

Discussion: When a vehicle contacts electrical power lines, best practice is for all passengers to remain in the vehicle and call 911. Due to the high voltage carried within power lines, electrical current can easily travel through the vehicle and into the ground below, electrifying a radius of up to 30 feet from the vehicle. In this instance, one of the dump truck’s tires caught fire, requiring the victim to exit the vehicle before the power could be disconnected. In situations where employees must exit a charged vehicle, it is recommended to jump away from the truck as far as possible with both feet launching and then landing simultaneously. As you move away from the vehicle, do not lift your feet to walk. Instead, keep your feet on the ground and scoot away, not allowing the heel of one foot to move past the toe of the other. Continue this method until you are 30 feet from the vehicle. If a tingle is still felt in the body after 30 feet, continue shuffling away from the vehicle until you no longer feel this effect⁵.

DISCLAIMER

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REFERENCES

¹ "Historical Weather." Archive. Weather Underground. <https://www.wunderground.com/history>

² Job Hazard Analysis. <https://www.osha.gov/Publications/osh3071.pdf>

³ Safety and Health Regulations for Construction. <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.601>

⁴ Minimum Clearance Distance. <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1408>

⁵ Powerline Safety Best Practice for Dump Truck Operators. <https://s3.amazonaws.com/images.chaptermanager.com/chapters/cd2f8590-ff70-8eca-4c04-88afc4766544/files/powerline-safety-best-practices-dumptruckoperators-1495666890912.pdf>

INVESTIGATOR INFORMATION

This investigation was conducted by DeAnna McIntosh, Safety Specialist, Fatality Assessment and Control Evaluation, Kentucky Injury Prevention and Research Center, University of Kentucky, College of Public Health.

ACKNOWLEDGEMENTS

The Kentucky FACE program would like acknowledge the Coroner and the police department for their assistance with this report.

SURVEY

[Please click here](#) to take a brief, anonymous survey concerning this report. Your feedback and opinions are appreciated.