

Electrocution is a significant hazard in the construction industry, ranking as the fourth leading cause of death among workers in the United States. Big risks that contribute to fatal electrical injuries include:



- working on or near live wires
- failure to use lockout/tagout procedures
- accidental contact with overhead power lines
- not utilizing required personal protective equipment (PPE)
- lack of basic electrical safety knowledge



As you go over these fatal construction incidents, review what went wrong and how these tragedies could have been prevented. Consider how the safety tips below and the lessons learned on these reports can be applied to make your job safer.

- Ensure the machinery or power tools you are using are properly grounded or double insulated.
- Contact utility companies in advance to de-energize or insulate overhead power lines.
- Stay at least 10 feet away from live overhead power lines.
- Check all extension and power cords for wear and tear before use.
- Keep metal objects and equipment, including ladders, away from live electrical circuits.
- Confirm you understand the hazards and safe practices of the work you are doing.

DANGER

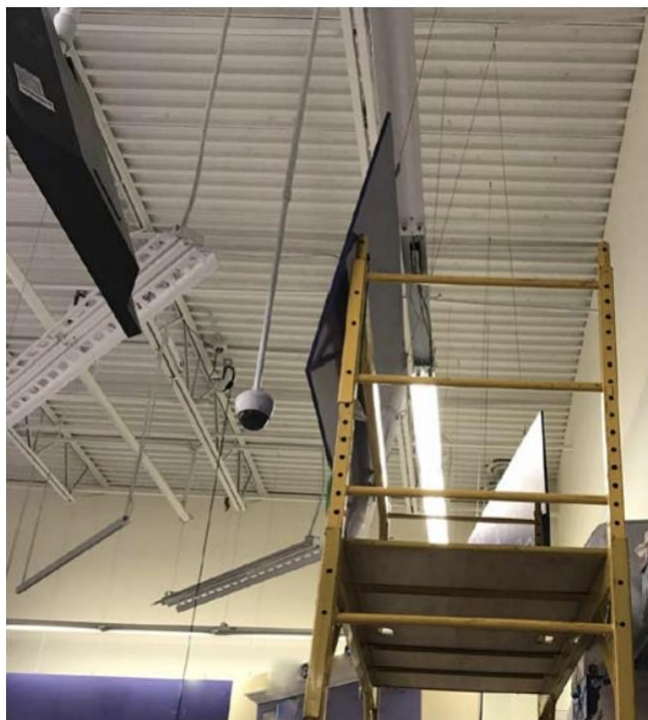


**ELECTRICAL
HAZARD**

TECHNICIAN ELECTROCUTED REPLACING OVERHEAD LIGHT FIXTURES

Contract workers on scaffolds were replacing lighting fixtures during a night shift at a large retail chain store. Portable (secondary) lighting was not installed, and the job relied on the store lighting illumination. It was assumed that all stores were on the 120V single-phase circuits and previously retrofitted with luminaire (quick) disconnects.

Before work began the foreman identified the incorrect electrical panel (for accent lighting only) and the main store lighting was actually in an uninspected 480/277V 3-phase panel. The fixtures did not have a quick disconnect. One of the workers was electrocuted and found dead on the scaffolding later into the shift. After the incident, the foreman and remaining crew continued to work exposing themselves to similar, and potentially fatal, hazards.



Scaffold location at the time of the incident

OSHA Standard 1926.20(b)(2) [Requirement for] *frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the employers.*

- A competent person should be at the job site to identify and mitigate workplace hazards.
- Before electrical work begins, live electrical circuits should be de-energized, locked out so the circuit is inoperable, and tagged so that others on the job site know who locked out the circuit.
- Appropriate PPE must be utilized for electrical work, which may include a Class A protective helmet, insulated foot protection, insulated tools, and gloves.

DANGER



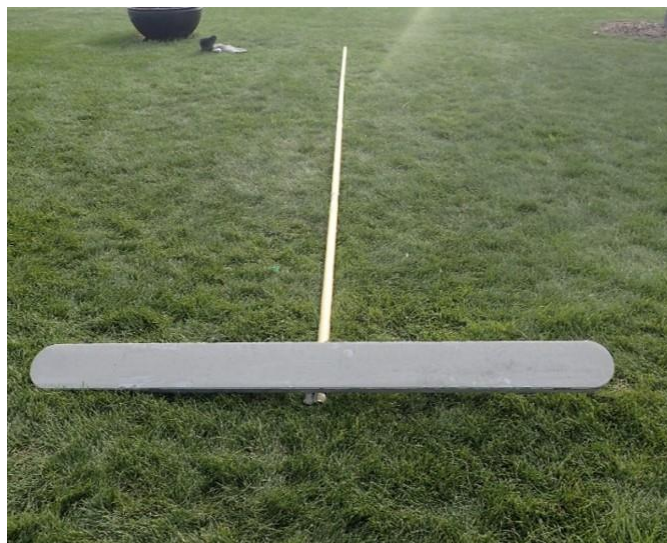
**ELECTRICAL
HAZARD**

CONCRETE FINISHER ELECTROCUTED WHEN TOOL HANDLE TOUCHED POWER LINE

A work team was performing concrete finishing work for a residential driveway. One member of the team was using a 29-foot-long bull float while wearing non-electrical rated rubber boots over his leather work boots, vinyl work gloves, a hard hat, and safety glasses. There was a line of brush near the work area that may have required him to lift the bull float handle rather than pull it in a more horizontal position.

During the job, the handle of the metal bull float accidentally made contact with an energized 7,200-volt overhead power line. When the handle contacted the power line the worker fell forward, letting go of the pole. Emergency response was called, and he was transported to a local hospital where he died.

OSHA Standard 1926.416(a)(3) *Before work is begun ...the employer shall advise employees of the location of such [energized electric] lines, the hazards involved, and the protective measures to be taken.*



Bull float used at the time of the incident

- Before every outdoor work project, conduct a jobsite survey and hazard assessment to identify all potential hazards, including those associated with overhead power lines.
- When working near overhead power lines ensure that a minimum of 10 feet of space is maintained between any equipment and the power line.
- Utilize long handles on tools that are insulated or non-conductive. Aluminum handles may be favored because of weight and durability, but insulated or non-conductive handles should be used on these tools when working near overhead power lines.

DANGER



**ELECTRICAL
HAZARD**

MECHANIC ELECTROCUTED WHEN MOBILE LIGHT TOWER CONTACTED POWER LINE

At a roadway construction site one worker was assigned to take down ten mobile light towers at the site and return them to a local rental company one at a time with the company truck. He was working alone on this task.

After returning three light towers he started taking down the fourth which was positioned off the pavement on the grass under a 7,620-volt power line that was 24.6 feet above the ground. For an unknown reason he extended the telescopic mast and raised the light tower instead of retracting and lowering it. This is when the light tower came in contact with the power line. The worker was electrocuted, and the electric current then ignited the diesel in the tower's fuel tank causing an explosion which set the light tower on fire.



Scene after the incident

- A jobsite hazard survey and evaluation should be performed by a competent person prior to placing mobile light towers at a construction site. The hazard survey should identify:
 - the location and height of all overhead power lines,
 - equipment to be placed under or near the power line and the size (maximum height) of this equipment,
 - tasks to be performed underneath and in proximity to an overhead power line, and
 - workers who are to perform those tasks.
- Once potential hazards are identified, appropriate control measures should be developed and implemented.
- A spotter should be designated to observe clearances under or near power lines and help guide the operation of the light towers.

DANGER



**ELECTRICAL
HAZARD**

PAINTER ELECTROCUTED USING ALUMINUM EXTENSION LADDER NEAR POWER LINE

A five-man crew was subcontracted to paint and caulk windows and siding on a newly constructed three-story private residence. One member of the team had positioned his aluminum extension ladder between the side of the house and a wooden fence.

The worker using the ladder climbed down and began to re-position it on the side of the house. One of the other crew members heard him yell and turned to see him trying to hold onto the ladder as it fell backward. As the ladder fell backward, it touched a 13.8-kilovolt power line that was located approximately 10 feet from the side of the house. He was electrocuted because he was holding the ladder and did not survive.

- Do not use metal ladders for electrical work or on any job where there is a possibility of contact with electrical conductors, like power lines. Instead use ladders made of non-conductive materials, like fiberglass.
- During any work project keep a safe distance between power lines and ladders, tools, and materials at all times.
- Lower extension ladders before moving them. This makes the ladders more maneuverable and easier to handle.



OSHA Standard 1926.955(c) *Portable metal ladders and other portable conductive ladders may not be used near exposed energized lines or equipment.*

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INCIDENT REPORTS

- Oregon State FACE Report 2018OR40; cdc.gov/niosh/face/stateface/or/18or040.html
- Michigan Case Report 16MI104; cdc.gov/niosh/face/stateface/mi/16MI104.html
- New York Case Report 12NY018; cdc.gov/niosh/face/stateface/ny/12NY018.html
- NIOSH In-house FACE Report 2003-11; cdc.gov/niosh/face/In-house/full200311.html

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