SAFETY

TOOLBOX TALK

August 8, 2025

Low Voltage Electrical Hazards

We continue to identify too many low voltage electrical hazards in 2025 on our job sites. Low voltage electrical systems in construction still present significant hazards. These include electric shock, arc flash burns, and secondary injuries from falls or being thrown due to muscle contractions. Even low voltage can cause severe burns, cardiac issues, and fatalities.

- **Electric Shock:** Low voltages can cause muscle contractions, making it difficult to release a conductor and leading to prolonged exposure and potential internal organ damage and heart fibrillation.
- **Arc Flash:** Low voltage systems can produce dangerous arc flashes, which can cause severe burns and ignite flammable materials.
- **Secondary Injuries:** Muscle spasms from shocks can cause workers to fall from heights or be thrown into objects, resulting in additional injuries.
    - **a.** Burns: Both electrical burns and arc flash burns can occur, with low voltage systems potentially causing deep tissue damage and extensive scarring.
    - **b.** Cardiac Arrest: Electrical current passing through the heart can disrupt its rhythm, leading to cardiac arrest.
    - **c.** Fire: Arc flashes can ignite combustible materials, leading to fires and potential explosions.

All examples above have a common root cause. They all go back to an act of non-compliant behavior from employees and/or construction site leadership.

SOURCES OF HAZARDS

1. Wet Conditions: Water and damp environments reduce the body's resistance to electricity, increasing the risk of electrocution.
2. Damaged Equipment: Damaged cords, tools with missing ground prongs, and improperly rated equipment create shock and fire hazards.
3. Lack of Proper PPE: Not using appropriate Personal Protective Equipment (PPE), like GFCIs, grounded extension cords, arc-rated clothing, and gloves, can increase the severity of injuries from electrical hazards.
4. Working Near Energized Wires or Equipment: Working near exposed, energized parts of electrical equipment, even if not directly touching them, poses a risk of arc flash and shock.
5. Improper Lockout/Tagout: Failure to properly de-energize and lockout/tagout equipment before working on it can expose workers to live parts.

REGULATIONS

- 1926.404(b)(1)(iii)(C): Inspect all cords, plugs, and receptacles daily for damage. Do not use until repaired if defects are found.
- 1926.403(b)(2): Use equipment only as listed, labeled, or certified by the manufacturer.
- 1926.405(a)(2)(ii)(F): Do not suspend temporary lights by cords unless designed for it.
- 1926.405(j)(1)(i): Fixtures, lamps, and receptacles must not have exposed live parts within 8 feet of the floor.
- 1926.417(b): De-energized circuits must be locked/tagged out at all points of possible energizing.
- 1926.404(b)(1)(i): Protect workers with GFCIs or an assured grounding conductor program.
- 1926.403(b)(1): All electrical equipment must be free from recognized hazards.
- 1926.405(a)(2)(ii)(A): Feeders must originate in a distribution center and be run in cord, cable, or raceways unless protected as open conductors.
- 1926.405(a)(2)(ii)(I): Protect flexible cords from damage; avoid sharp edges or pinch points unless protection is provided.
- 1926.403(i)(2)(i): Guard live parts of 50 volts or more with enclosures or barriers.

EXAMPLE INCIDENTS

- A man died after being electrocuted while doing construction work at the Walmart Distribution Center in Grove City when he touched an exposed wire while working in a bathroom ceiling, July 25, 2025.

- Coroner confirms Anderson County employee electrocuted to death while working on an HVAC system, July 18, 2024.
- Employee was electrocuted and killed while inspecting electrical panels at Tesla's Austin Gigafactory, May 19, 2025.

THE BASICS

To protect workers from electrocution, employees and employers should do the following:

- Rigorous Inspection: Regularly inspect all electrical equipment and tools for damage or wear.
- Safety Inspections: Mandate and enforce a 100% GFCI protection program.
- Proper Grounding: Ensure proper grounding of all equipment to provide a path for fault currents.
- Adequate PPE: Always wear appropriate PPE for the task, including arc-rated clothing, gloves, and eye protection. Use a buddy system and do not allow new workers to work alone.
- Training and Awareness: Provide comprehensive electrical safety training to all workers. These increased precautions should last for 1–2 weeks.

WHAT YOU NEED TO KNOW

- Even "low voltage" can be deadly.
- Always treat every circuit as if it is energized until proven otherwise.
- Use only tools and equipment that are properly rated and inspected.
- Never bypass safety devices such as GFCIs or breakers.
- Wet or damp conditions greatly increase the risk of shock.
- Muscle contractions caused by electrical contact can prevent you from letting go.
- Arc flashes can occur without direct contact and cause severe burns.
- Lockout/Tagout is the only safe method before working on electrical systems.
- Secondary injuries, such as falls, can result from even minor shocks.
- Proper PPE, including insulated gloves and arc-rated clothing, is essential.

IMPORTANT DO'S TO KEEP IN MIND ABOUT LOW VOLTAGE ELECTRICAL

- DO use GFCIs on all temporary power and cords.
- DO inspect tools, cords, and equipment before use.
- DO keep work areas dry when possible.
- DO use insulated tools near electrical systems.
- DO tag and report damaged equipment immediately.
- DO stay clear of exposed conductors.
- DO follow Lockout/Tagout before work.
- DO wear proper PPE (gloves, eye protection, arc-rated clothing).
- DO stop work and notify a supervisor if conditions are unsafe.

IMPORTANT DON'TS TO KEEP IN MIND ABOUT LOW VOLTAGE ELECTRICAL

- DO NOT assume low voltage is safe.
- DO NOT use damaged cords or missing ground prongs.
- DO NOT work in wet areas without protection.
- DO NOT bypass breakers, fuses, or safety devices.
- DO NOT touch exposed wiring without de-energizing.
- DO NOT wear metal jewelry while working.
- DO NOT overload circuits.
- DO NOT allow untrained workers near electrical systems.
- DO NOT continue if a hazard has not been corrected

Occupational Safety and Health Administration. 1926 Subpart K – Electrical Standards. U.S. Department of Labor, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926SubpartK. Accessed 15 Sept. 2025.

Occupational Safety and Health Administration. 1926 Subpart E – Electrical Standards. U.S. Department of Labor, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926SubpartE. Accessed 15 Sept. 2025.

"Worker Dies After Electrocution at Walmart Distribution Center." Grove City News, 25 July 2025.

"Anderson County Employee Electrocuted While Working on HVAC System." Anderson Independent Mail, 18 July 2024.

"Worker Killed in Electrical Accident at Tesla Gigafactory." Austin American-Statesman, 19 May 2025.

Occupational Safety and Health Administration. 29 CFR 1926.404(b)(1)(iii)(C): Electrical—Inspection of Cord Sets and Equipment. U.S. Department of Labor, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.404. Accessed 15 Sept. 2025.

Occupational Safety and Health Administration. 29 CFR 1926.403(b)(2): Electrical—Installation and Use of Equipment. U.S. Department of Labor, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.403. Accessed 15 Sept. 2025.

Occupational Safety and Health Administration. 29 CFR 1926.405(a)(2)(ii)(F): Electrical—Temporary Lighting. U.S. Department of Labor, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.405. Accessed 15 Sept. 2025.

Occupational Safety and Health Administration. 29 CFR 1926.417(b): Electrical—Lockout/Tagout of Circuits. U.S. Department of Labor, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.417. Accessed 15 Sept. 2025.

- DO follow proper Lockout/Tagout procedures before beginning work.
- DO wear the appropriate PPE for the task, including gloves, eye protection, and arc-rated clothing.
- DO stop work and notify your supervisor if unsafe conditions exist.

IMPORTANT DON'TS TO KEEP IN MIND ABOUT LOW VOLTAGE ELECTRICAL

- DO NOT assume low voltage is safe.
- DO NOT use cords or tools with missing ground prongs or visible damage.
- DO NOT work with electricity in wet or damp areas without proper protection.
- DO NOT bypass breakers, fuses, or other safety devices.
- DO NOT touch exposed wiring or terminals without de-energizing first.
- DO NOT wear conductive items such as metal jewelry while working.
- DO NOT overload circuits with multiple tools or equipment.
- DO NOT allow untrained personnel to work near electrical systems.
- DO NOT continue work if an electrical hazard has not been corrected.

Occupational Safety and Health Administration. 1926 Subpart K – Electrical Standards. U.S. Department of Labor, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926SubpartK. Accessed 15 Sept. 2025.

Occupational Safety and Health Administration. 1926 Subpart E – Electrical Standards. U.S. Department of Labor, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926SubpartE. Accessed 15 Sept. 2025.

"Worker Dies After Electrocution at Walmart Distribution Center." Grove City News, 25 July 2025.

"Anderson County Employee Electrocuted While Working on HVAC System." Anderson Independent Mail, 18 July 2024.

"Worker Killed in Electrical Accident at Tesla Gigafactory." Austin American-Statesman, 19 May 2025.

QUANDEL IS COMMITTED TO OUR NUMBER ONE CORE VALUE:
SAFETY: FIRST. LAST. ALWAYS!

quandel.com