# Content Outline: OSHA Electrical Safety Standard 1926.431 and Related Hazards

## OSHA Electrical Safety Standards

* • OSHA Standard 1910.137(b)(2): Personal Protective Equipment (PPE) requirements including rubber gloves, face shields, insulating sleeves, and flame-resistant clothing.
* • OSHA Standard 1926.431: Focuses on equipment upkeep and maintenance such as explosion-proofing, dust-proofing, general maintenance, and immediate reporting and repair.
* • OSHA Standard 1926.416(a)(3): Ensures workers are aware of circuits, proper labeling, and de-energizing circuits to prevent injury.

## General Electrical Safety Tips

* 1. Make a Plan: Identify hazards, PPE/IPE requirements, and circuit shut-off procedures.
* 2. Wear Appropriate Clothing and Gear: Use rubber gloves, flame-resistant clothing, avoid metal accessories.
* 3. Use the Buddy System: Ensure backup in emergencies and CPR knowledge.
* 4. Follow Lock Out Tag Out (LOTO) Procedures: Six-step process to ensure circuits are fully de-energized.
* 5. Avoid Wet Areas: Prevent electric shock by keeping work areas dry.
* 6. Use Ground Fault Circuit Interrupters (GFCIs): Automatically cut power during surges.
* 7. Stay Clear of Overhead Lines: Maintain a minimum of 10 feet distance.
* 8. Inspect Power Cords and Outlets: Replace damaged cords and look for signs of wear.

## Understanding Electrical Hazards

* • Electrical shock occurs when the body becomes part of a circuit, leading to burns, fractures, or death.
* • Severity depends on current, path through the body, and duration.
* • Even low voltages can be fatal if contact is prolonged.
* • Use non-conductive tools to rescue victims; administer CPR if trained.

## Common Hazards and Preventive Steps

* • Do not perform electrical work unless qualified.
* • Use UL-listed equipment only.
* • Remove all jewelry when working with electricity.
* • Follow PPE inspection protocols.
* • Use insulated tools and avoid aluminum ladders.
* • Follow strict lock-out/tag-out procedures.
* • Avoid extension cords for fixed equipment.
* • Inspect cords and plugs regularly and ensure proper grounding.
* • Maintain clear access to electrical panels with all breakers labeled.

## Electrophoresis Equipment Safety

* • Review MSDS for hazardous chemicals used (e.g., ethidium bromide, acrylamide).
* • Follow all electrical safety measures with electrophoresis units (GFCIs, labeled hazards, 3-prong plugs).
* • Use one hand when connecting leads; turn off power before accessing gel chambers.
* • Exercise caution with thermal hazards (e.g., hot agarose).
* • Use protective gear for UV exposure during visualization.