

Electrical Hazards – Operating Equipment Near Energized Powerlines

Operating equipment near energized powerlines poses significant risks, including electrical shock, burns, and fatalities. Overhead and underground powerlines are frequently struck by construction equipment such as dump trucks, cranes, elevating work platforms, ladders, and rolling scaffolds. Electrical shock occurs when electric current passes through the body, potentially causing cardiac arrest, severe burns, involuntary movements, or even death.

Regulatory and Safety Standards

In Saudi Arabia, work near energized powerlines must comply with HSE regulations and industry best practices. These regulations require:

- Identification of all electrical hazards on construction projects.
- Only competent persons are permitted to perform work on or near electrical systems.
- Implementation of written safe work procedures to protect workers from electrical hazards.
- Communication of these procedures to all workers and, when necessary, to neighboring electrical system owners.

Key Hazards and Precautions

Overhead and Underground Powerlines:

- Identify all powerlines, including high and low-voltage services, distribution systems, and transmission lines.
- Maintain minimum safe distances from energized powerlines as per Saudi Arabian regulations.

Conductive Equipment and Materials:

- Tools, ladders, scaffolding, and other conductive materials must not be stored or used near energized equipment or conductors.

Written Safe Work Procedures:

- Establish and implement written measures to protect workers from electrical shock and burns.
- Ensure all workers are trained on and follow these procedures.

Minimum Safe Distances from Powerlines (Safe Working Distances by Voltage Level - (NFPA 70E or OSHA 1910 Subpart S).

When working near live overhead powerlines, the following minimum distances must be maintained:

Voltage Level (kV)	Safe Distance (meters)	Safe Distance (feet)
1 - 50 kV	3.0 meters	10 feet
51 - 300 kV	6.0 meters	20 feet
301 - 500 kV	7.5 meters	25 feet
501 - 750 kV	10.0 meters	33 feet
751 - 1000 kV	12.0 meters	40 feet

Responsibilities of NCC T&D Project Leaders

NCC T&D Project Leaders are responsible for ensuring the safety of workers operating near energized powerlines. This includes:

- Identifying Electrical Hazards: Locate all overhead and underground powerlines before starting work.
- Implementing Safe Work Procedures: Develop and enforce written procedures to protect workers.
- Providing Training: Ensure all workers are trained on safe work practices and emergency response.
- Installing Warning Devices: Place visible warning signs, such as “Danger! Electrical Powerlines Overhead,” in hazardous areas.
- Designating Signallers: Assign competent workers as signallers to warn equipment operators when approaching minimum safe distances.

Worker Responsibilities

- Follow all written safe work procedures.
- Maintain minimum safe distances from energized powerlines.
- Use non-conductive tools and equipment where possible.
- Report any electrical hazards or incidents immediately.

Additional Considerations for NCC T&D Projects

Given the high-risk nature of NCC T&D's operations, the following measures are recommended:

- Conduct pre-work hazard assessments to identify and mitigate risks.
- Use insulated tools and equipment when working near energized systems.
- Implement real-time monitoring systems to detect proximity to powerlines.
- Ensure all workers are equipped with appropriate PPE, including insulated gloves and protective clothing.

For more information, refer to NCC T&D's relevant IMS procedures or consult our HSE Department for expert guidance and training resources aligned with Saudi Arabian regulatory requirements.

