

Electrical Hazards – Working on Energized Systems

Working on or near energized electrical systems is inherently hazardous and requires strict adherence to safety protocols to prevent electrical shock, burns, arc flashes, and fatalities. This section outlines the requirements and precautions for performing such work in compliance with relevant HSE regulations and industry best practices.

Safety Standards

In T&D workplaces, electrical work on or near transmission and distribution systems must comply with relevant HSE regulations and industry standards. These regulations require:

- Only authorized and competent workers may perform work on energized systems.
- Written safe work procedures must be established and followed to protect workers.
- Workers must use appropriate personal protective equipment (PPE) and tools designed for electrical work.

Authorized Workers

- Work on energized systems must be performed by authorized workers who:
- Have formal permission from the employer and system owner.
- Are trained and competent to perform work on or near electrical transmission and distribution systems.
- Hold the appropriate certifications or qualifications as required by Saudi Arabian regulations.

Conditions for Working on Energized Systems

Work on energized systems is permitted only under specific conditions, including:

Testing and Diagnostic Work:

- Testing with meters or diagnostic devices is considered work on energized equipment.
- Workers must use appropriate PPE, including arc flash protective clothing and voltage-rated gloves.
- Written safe work procedures must be followed.

When De-Energizing is Not Possible:

- Work may proceed if disconnecting the system would create a greater hazard.
- The system must be rated at nominal voltage or less. In consultation with the HSE team and the client, it must be ensured that the work can be performed safely without disconnecting the system, and written approval or a permit is obtained.

High-Voltage Systems:

- Work is permitted only if the system owner and/or client provides a maintenance record showing compliance with manufacturer specifications.
- A copy of the maintenance record must be available at the project site.
- T&D project leaders, in consultation with the HSE team and the client, must ensure that the work can be performed safely without disconnecting the system and that written approval/permit is obtained.

Responsibilities of NCC T&D Project Leaders

NCC T&D Project Leaders are responsible for ensuring the safety of workers performing work on energized systems. This includes:

- **Developing Written Safe Work Procedures:** Establish and implement procedures to protect workers from electrical shock and burns.
- **Providing Training:** Ensure workers are trained on safe work practices and emergency response.
- **Supplying Appropriate PPE:** Provide voltage-rated gloves, arc flash protective clothing, and other necessary equipment.
- **Conducting Inspections:** Regularly inspect tools, equipment, and PPE to ensure they meet industry standards.

Worker Responsibilities

- Follow all written safe work procedures.
- Use appropriate PPE and tools for the task.
- Verify that the power supply is disconnected, locked out, and tagged before beginning work.
- Inspect rubber gloves and leather protectors for damage before each use.
- Report any electrical hazards or defective equipment immediately.

Lockout/Tagout Procedures

Before working on energized systems:

- Disconnect the power supply and lock out the system.
- Tag the system to indicate it is locked out and provide details such as the reason for lockout, the name of the person who performed it, and the date and time.
- Verify that the system is de-energized and that hazardous stored energy is discharged or contained.

Protective Measures and Equipment

Rubber Gloves and Leather Protectors:

- Must be rated for the voltage of the system.
- Must be inspected for damage before each use.
- Must be tested every three months if in service, or every six months if not in service.

Arc Flash Protective Clothing:

- Must meet industry standards and provide adequate protection.
- Must be worn when working on systems with a risk of arc flash.

Tools and Equipment:

- Must be non-conductive and rated for the voltage of the system.
- Must be maintained in good condition and inspected regularly.

Emergency Preparedness

- A supervisor with competent worker trained in rescue operations, including First Aid CPR and/or BLS, must be stationed nearby when working on Energized Systems.
- Emergency response procedures must be in place and communicated to all workers.

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 energized conductors.
- Ensure all workers are equipped with appropriate PPE, including insulated gloves and arc flash 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.