

## Electrical – Field/General Operations

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### 16.1 PURPOSE

To clarify requirements and address safety-related work practices to prevent electrical shock. This policy applies to work on exposed de-energized parts, work near electrical hazards, and general work tasks.

### 16.2 GENERAL

The identification of electrical hazards is essential in maintaining electrical safety. T.A. Woods Company employees are responsible for reporting all electrical safety hazards.

Only competent employees will be allowed to perform electrical work. Only qualified employees may work on electrical parts or equipment. Such employees are to be made familiar with the use of special precautionary techniques, such as PPE, shielding or insulating tools and materials. Any electrical work done by a T.A. Woods Company employee will be done under guidelines of the National Electrical Code (NEC), National Fire Protection Association (NFPA) Standard 70E, and Occupation Safety & Health Act Regulations 29 CFR 1910.269 Subpart S.

No employee will be allowed to work in such proximity to any part of an electric power circuit that the employee could contact the circuit in the course of work, unless the employee is protected against electrical shock by controlling hazardous energy (LOTO), grounding practices, or other acceptable means. See Chapter 17 Control of Hazardous Energy.

Employees are expected to utilize a hand-held portable meter, often called a hot stick, to determine if there is electrical current prior to onset of assigned tasks.

Ground Fault Circuit Interrupter (GFCI) devices will be used for all cord and plug activities unless permanent GFCI installations are available. Devices in wet locations may include GFCI receptacles, receptacles protected by GFCI breakers or in field operations, portable cord-connected GFCI.

All electrical equipment used at field locations will be powered through Ground Fault Circuit Breaker panels or through systems using Ground Fault Circuit Interrupters (GFCI). All portable power tools, equipment whether owned or rented, must be inspected and in good working condition. Damaged tools and/or equipment must be Red tagged and returned to the fabrication facility for repair or replacement.

### 16.3 EXTENSION CORDS and FLEXIBLE ELECTRIC CORDS

Extension cords (drop cords) will be of a three-wire type, grounding type, will be protected from damage, and will not be fastened with staples, hung with nails or hung from electrical wires. Extension cords will be inspected prior to each use and all cords found to be worn or frayed, must be removed from service immediately. Plugs and receptacles designed to be used with different voltages, frequencies or types of current (AC or DC), must be compatible only to each other. Flexible cords should be spliced only with molded or vulcanized splices with insulation equal to or greater than the cable's. Repaired extension cords (plugs) will no longer be considered all-weather cords. All cords and temporary distribution boxes will have Ground Fault Circuit Interrupters (GFCI). Damaged cords should be removed from work areas, Red Tagged and returned to the fabrication facility, repaired by a competent person.

Portable equipment and tools shall be handled in a manner which will not cause damage. Flexible electric cords connected to equipment or tools may not be used for raising or lowering equipment. Do not fasten cords with staples or other fasteners which may cause damage to the outer jacket.

**Visual Inspection – Portable Cord-** and plug connected equipment and extension cords will be visually inspected before use on any shift for external defects and for evidence of possible internal damage. Defective or damaged items will be Red tagged, removed from service until repaired or replaced.

### 16.4 TEMPORARY LIGHT STRINGS

Temporary lights supplied on a project, whether as the electrical contractor or trade-specific task lighting must be equipped as commercial electrical cords with connectors and insulation maintained in a safe condition. Illumination standards must be met. All bulbs on temporary light strings must be equipped with appropriate guards/cages. Temporary light strings must not be suspended from their electrical cords unless they are designed for that purpose. Temporary lighting strings will be suspended using non-conductive materials. If strings must pass through conductive materials, such as sleeves or similar, non-conductive material must be used to encase the conductive material. Where required, temporary light strings used in moist or hazardous locations (tanks, vessels or drums) must be operated at a maximum of 12 volts or less as determined by the tasks.

When designated as the electrical contractor and per contract, T.A. Woods Company is responsible for inspecting and maintaining temporary lighting in common areas such as paths of access/egress and should be inspected daily. Bulbs should be replaced as needed. Cages must be clasped shut. Task lighting is the responsibility of each subcontractor and should be inspected by the subcontractor.

## **16.5 OVERHEAD POWER LINES**

All operations involving the use of cranes, boomtrucks, telescoping forklifts or other equipment in close proximity of power and transmission lines, must be operated in accordance with manufacturer's specifications and in compliance with the OSHA regulations identifying distances listed below:

- 16.5.1** In field operations, the job hazard analysis will have disclosed the presence of power lines before work is initiated. The project supervisor will verify with the entity in control of the project or the utility responsible for the lines in right-of-ways that lines that pose a hazard to operations have been de-energized. The project supervisor will document this verification and the identity of the contact person(s) on the job hazard analysis.
- 16.5.2** For lines rated 50 kV or below, minimum clearance between the lines and any part of the equipment or machinery or load should be 10 feet.
- 16.5.3** For lines rated over 50 kV, minimum clearance between the lines and any part of the equipment or machinery should be 10 feet plus 0.4 inch for each 1 kV over 50 kV or use twice the length of the line insulator but never less than 10 feet.
- 16.5.4** In transit with no load and boom lowered, the equipment clearance should be a minimum of 4 feet for voltages less than 50 kV and 10 feet for voltages over 50 kV up to and including 345 kV and 16 feet for voltages up to and including 750 kV.
- 16.5.5** A person will be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
- 16.5.6** Cage-type boom guards, insulating links or proximity warning devices may be used on equipment, but the use of such devices cannot alter the requirements of any other regulation of this part even if such device is required by law or regulation.
- 16.5.7** Any overhead wire should be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and has been visibly grounded, relocated or protected.

## **16.6 TEMPORARY AND PERMANENT POWER ON PROJECT SITES**

If TAW is contracted as the electrical contractor, safety for both temporary power and permanent power resources in the area of active work tasks are the responsibility of TAW. Controlling contractor or building owner can supersede this provision.

When utilizing temporary power, the competent person must inspect and maintain all components of the temporary system ensuring a safe load, all-weather covers, etc as well as

compliance by subcontractors on site. This inspection should be conducted daily prior to the onset of any work tasks. TAW identification and contact information should be attached to the temporary power source.

Temporary and Permanent power sources should be considered off-limits by any employees other than those assigned as a Competent Person and with delegated authority.