1.0 ACTIVITY DESCRIPTION

1.1 All employees should be aware of the hazards of working around overhead utility lines and how to minimize the chance of contact. All personnel involved should take precautions to ensure the safety of themselves and other personnel and the integrity of the existing overhead utility line facilities.

1.2 All personnel have, and should use, "Stop Work" authority whenever equipment breaches, or is about to breach the allowable clearances for work or for travel.

1.3 This document is not meant to supersede or replace regulatory requirements, nor is it intended to be all inclusive of the applicable regulatory requirements. It is intended to be supportive and complimentary to such requirements.

2.0 HAZARD ASSESSMENT

2.1 Hazard assessments are performed to identify and mitigate perceived and actual environmental and operational hazards (e.g., those related to overhead utility lines) and to prescribe the appropriate controls to address the identified hazard(s).

2.2 Conduct a hazard assessment at the beginning of each work shift and/or prior to starting a new task.

2.3 Review and update hazard assessments when:

- Each new task is begun.
- There is a change in how a task is performed.
- Changes in work site conditions occur (e.g., extreme temperatures, line strike).
- A specific need or concern is identified (i.e., as needed to ensure the safety of personnel or property).

3.0 RESPONSIBILITIES

3.1 Management Responsibilities (includes all personnel with a supervisory role)

3.1.1 Empower all personnel with the authority to “Stop Work” whenever hazardous conditions or potentially hazardous conditions are identified.

3.1.2 Identify all overhead utility lines on or off the work site that may be impacted by the project.

3.1.3 Notify and work closely with the utility company during the project to prevent contact with and maintain required clearances from the overhead utility lines.

3.1.4 Require and verify that signage and visual warning devices are installed as necessary to alert employees to the hazard.

3.1.5 Require and confirm that when work is being performed near energized power lines, the power company has been contacted to determine the voltage present and any other special requirements.

3.1.6 Require all lifting or boom type equipment to be clearly marked to show the maximum height or extension possible as measured from the ground or restrained to limit the maximum limit of extension.

3.1.7 Provide for and require the use of trained and dedicated Spotters in locations where equipment and vehicles pass and/or work under or around overhead utility lines.

3.1.8 Ensure that Spotters are given adequate training.

3.1.9 Provide for and require the use of at least three (3) layers of controls to be used with a Dedicated Spotter as one of the controls. (See section 4.1 below for additional information)

3.1.10 Provide for and require that all affected personnel are trained to recognize the hazards of working around overhead utility lines and are made aware of all site-specific hazards.

3.2 Health and Safety (H&S) Responsibilities

3.2.1 A Health and Safety Professional is involved with performing the hazard assessment and providing guidance during execution of the work.

3.2.2 Immediately stop and correct any H&S related non-compliant activities.

3.2.3 Evaluate the effectiveness of the site-specific safety plan.

3.2.4 Verify that all affected personnel are trained to recognize the hazards of working around overhead utility lines and are made aware of all site-specific hazards.

3.3 Employee Responsibilities

3.3.1 Invoke ‘Stop Work’ authority whenever work-site conditions warrant or when work site safety may be compromised.

3.3.2 Assume all power lines are energized, maintain the appropriate distances and avoid contact at all times.

3.3.3 Know the height of your equipment, the height of the power lines, and the clearance required.

3.3.4 Locate and clearly identify all overhead utility lines. Do not work under or adjacent to utility lines unless they have been identified and appropriately marked.

3.3.5 Notify supervision of any observed or perceived safety deficiencies.

3.3.6 Do not touch or move any energized cables. The employee should contact the Supervisor, who should contact the utility company or direct the employee to do so before proceeding.

3.3.7 Do not operate or move equipment under or adjacent to overhead utility lines without a spotter.

4.0 HAZARD MITIGATION

4.1 Working Safely Around Overhead Utility Lines – Layering Controls

4.1.1 Layer a minimum of three (3) controls to prevent overhead utility strikes (e.g., multiple control contingencies or redundancies) and to ensure the safety of personnel and property in all instances where activities, including equipment and vehicle crossings, are taking place.

4.1.2 There are 5 families of control layers utilized to prevent contact with overhead utility lines. Use a Dedicated Spotter and at least two (2) other controls, such as those listed below, to provide for employee and property protection from an overhead utility strike.

- Dedicated Spotter (*Always Required*)
- Signage
- Physical Barriers
- Proximity Alarms
- Utility Controls

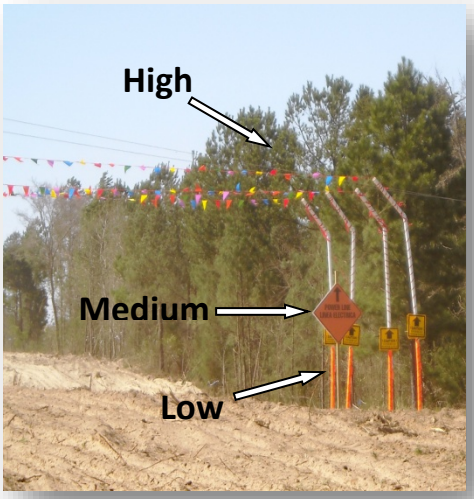
4.1.3 In all cases, one layer of control should be a trained, dedicated spotter (i.e., someone who cannot be assigned other duties that interfere with the ability to give a timely danger warning). A spotter should be located where equipment may pass under overhead power lines.

1. **Dedicated Spotter** – A trained employee not engaged in any other duties (e.g., swamping) while performing spotter duties.

- Their task is to monitor and direct traffic around lines, and should use an appropriate audible alarm (e.g., air horn) to warn the driver of potential danger.
- No equipment operator working alone can safely judge the distance from the equipment to an overhead power line without assistance. Work with a spotter whose only responsibility is to keep you and your equipment a safe distance from lines and other hazards.
- Don't risk injury or death by trying to guide a load and spot at the same time. Electricity can travel through a tag line and through you.

2. **Signage** – Signage covers three parts of the view plane:

   - HIGH: Devices used to mark the limits of the danger zones (e.g., ribbons and string, 'car lot' ribbon tied to overhead goal posts).
   - MEDIUM: Devices placed at eye level that provide warning information (e.g., "Beware of Overhead Lines", "High Voltage", and distance to conductor signs)
   - LOW: Devices placed at ground level to impede the travel of unauthorized equipment (e.g., barrels, flagging, traffic cones).



3. **Physical Barriers** – Non-conductive, highly visible devices (e.g., goal posts, barricade tape) set outside the limits of approach (limits will vary by jurisdiction, land restrictions and voltages) on both the coming in (upstream) and going away (downstream) sides.

   - Install goalposts on the coming in and going away sides of all overhead utility lines at a distance no closer than 25 feet when site-specific conditions permit. The exclusion zone should determine the goalpost wire/ribbon height.

4. **Proximity Alarms** – Ancillary alarms affixed to equipment booms / masts that warns an equipment Operator prior to reaching the danger zone.

5. **Utility Controls** – Site-specific controls prescribed and authorized for use by the utility owner (e.g., shielding, de-energizing, bonding, insulating).

4.2 General Protections

4.2.1 Avoid operation near the crossings of overhead power lines before warning sign placement.

4.2.2 Plan all work activities that will take place in close proximity to overhead utility lines.

4.2.3 All equipment attachments must be kept in the lowest possible position when traveling under overhead utilities.

4.2.4 Dry tag lines made of a nonconductive type material should be used when working near energized lines.

4.3 Grounding and Bonding

4.3.1 Use barricades or insulation to protect employees from hazardous ground fault situations which can develop within the first few feet or more outward from the grounding point.

4.3.2 Ground and bond welded pipe strings at a minimum of 500-foot intervals.

4.3.3 Additional temporary grounds are required when voltage levels in excess of 15 volts or greater are found.

4.3.4 Bonding and grounding should be performed on stacked pipe.

4.3.5 Bonding across cut-outs and tie-ins should be completed before other work begins in the area.

4.3.6 Installation of grounding mats at valve settings, cathodic test stations, cathodic rectifier installations and other appurtenances that have direct electrical contact to the pipe is recommended.

4.3.7 Voltage testing of all pipe, equipment, foreign structures in the work areas should performed at regular 4-hour intervals and if conditions change (e.g., rain), or as otherwise stipulated by the Owner/Operator.

4.4 Clearance Distances

4.4.1 When operating equipment or working near overhead lines, whether in an elevated position or on the ground, the person or conductive object should not approach an unguarded and energized line closer than 20 feet unless approved by the Utility Owner.

4.4.2 Mobile equipment in transit with boom, crane or other structure lowered will maintain clearance distances as follows:

- Up to 50 kV = at least 10 feet.
- 50 to 200 kV = 15 feet.
- 200 to 350 kV = 20 feet.

- 350 to 500 kV = 25 feet.
- 500 to 750 kV = 35 feet.
- 750 to 1,000 kV = 45 feet.
- Over 1,000 kV = as established by utility owner/operator.

4.5 Equipment

4.5.1 All ladders being used around power lines should be made of non-conductive materials.

4.5.2 Grounding Straps may be required on all rubber-tired vehicles.

4.5.3 Drag chains may be required as electrical grounds for rubber-tired construction equipment.

4.5.4 Do not perform refueling activities within 50 feet of a power transmission line, or a more stringent distance specified by the Utility Owner.

4.5.5 Use only non-conductive chokers, slings and lifting devices during material handling activities.

4.5.6 Keep materials bonded at all times, when transporting conductive loads (e.g., pipe, air compressor, pumps) in the proximity of high voltage lines.

4.6 Information for Equipment Operators

Note: The information below is typically part of operator training but included here for additional guidance

4.6.1 If contact or near proximity with an overhead power line is made:

- Stay calm and stop your machine
  - Shift into neutral.
  - Set parking brake.
  - Avoid touching metal inside of vehicle.
- Warn others of the contact.
- Stay seated on the machine until a qualified power company representative tells you it is safe to leave the machine.
- Do not attempt to make physical contact with the operator or equipment if you are on the ground.
- If you should leave equipment:
  - Leap as far from equipment as possible without contacting the machine.
  - Land with both feet together on the ground simultaneously.
  - Keep your feet side-by-side while you scuffle away from the equipment towards safety.
  - Avoid lifting feet while shuffling, avoid shuffling your feet more than 8 inches apart from each other, and do not allow anyone to come to your aid until you are clear of the high voltage zone.

4.6.2 Ensure equipment is inspected before further use.

5.0 TRAINING

5.1 Train all personnel in the hazards of working in close proximity to overhead utility lines and related emergency response procedures.

5.2 Provide spotter training for employees assigned to spotter activities.

6.0 REFERENCES

Current versions of the references automatically supersede the references listed below.

6.1 Occupational Safety and Health Administration (OSHA)

- 29 CFR 1926.1408 Subpart CC – Cranes & Derricks in Construction

7.0 REVISION HISTORY

Number	Date	Description
1.1	August 16, 2021	Correcting 4.4.2 to match OSHA 1926.1408(h)
1	October 2018	General Review and Update
0	September 2012	Initial publication of this INGAA Construction Safety Consensus Guidelines document.