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# 1.0 Purpose

1.1 To establish the requirements, responsibilities, and procedures for equipment working near or under power lines or other overhead hazards. Furthermore, the purpose of this policy is to ensure compliance with all Federal and State regulations.

# 2.0 Definitions

* 1. **Dedicated Spotter**- an individual whose sole responsibility is to watch the separation between the overhead hazard and the equipment. He/she must 1.) Have sufficient training to conduct their job accurately and efficiently; 2.) Be equipped with a visual aid to assist in identifying the minimum clearance distance; 3.) Be positioned to effectively gauge the clearance distance; 4.) Use equipment (radio, telephone, etc.) that enables them to communicate directly with the operator when necessary; and 5.) Give timely information to the operator.
  2. **Encroachment**- where any part of the crane, forklift, aerial lift, excavator, load line/load (including rigging and lifting accessories), etc. breaches a minimum clearance distance that is required to be maintained from a power line or other overhead hazard.
  3. **Site Supervisor**- Controlling organization supervisor that has control over the work site that the crane or piece of equipment is being used in and over the work that is being performed at the site.
  4. **Visual Aid**- a tool used to identify the minimum clearance distance by the dedicated spotter and the operator. Examples of visual aids are a clearly visible line painted on the ground; clearly visible line on stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).
  5. **Work Zone**- the area 360 degrees around the crane, excavator, etc. up to its maximum working radius or as defined by the physical boundary that clearly delineates the area that no part of the crane boom/excavator, etc. will cross.

# 3.0 General Requirements

* 1. Prior to start of work, Site Supervisor shall:
     1. Identify any overhead hazards.
     2. Determine the line voltage.
     3. Determine if any part of the operation (crane/derrick, load, load line, excavator, etc.) could get closer than **20** feet of a power line that is up to 345 kV or closer than **50** feet of a power line that exceeds 345 kV.
     4. Complete AISH 37-A Overhead Hazard Checklist
  2. If the operation falls within the allowable distances outlined in section 3.1.3 of this section, one of the following options must be met prior to start of work:
     1. *Option 1*: De-energize and ground the power line. NOTE: Site Supervisor shall confirm with the utility owner that the power line has been de-energized and visibly grounded at the worksite.
     2. *Option 2*: Ensure that no part of the crane, excavator, load, etc. gets closer than 20 feet of the power line that is up to 345 kV or closer than 50 feet of a power line that exceeds 345 kV by following requirements of 4.0 Preventing Encroachment of this procedure.
     3. *Option 3*: Use Table 1 to determine clearance
        1. Determine the lines voltage and the minimum approach distance permitted based on Table 1- Minimum Clearance Distances values.
        2. Determine if any part of the piece of equipment could get closer than the minimum approach distance to the power line in Table 1. If so refer to section 4.0 Preventing Encroachment.
        3. When Option 3 is used, the utility owner of the power lines must provide the requested voltage information prior to commencement of work or within two working days of the employer’s request.
  3. Site Supervisor must define the work zone either by delineating boundaries (using flags, guardrail, etc.) or defining the work zone around the crane up to the maximum crane radius with danger tape elevated off the ground.
  4. All power lines will be considered un-insulated and energized until the utility owner confirms that the power line has been and continues to be de- energized and visibly grounded.
  5. Ensure no unauthorized persons enter into the defined work zone during operations.
  6. Site Supervisor shall post at least one electrocution hazard warning sign conspicuously in the cab of the crane or piece of equipment within the operator’s view and at least two warning signs outside of the crane or piece of equipment.
  7. Clearance distances apply to areas **above, below, and laterally from the power lines**, not just from the base of the tower/pole.
  8. Equipment and other materials shall not be stored under power lines or other overhead hazards
  9. If tag lines are used, they must be nonconductive.
  10. Prior to working near a transmitter/communication tower where an electrical charge can be induced in the piece of equipment or materials being handled, the transmitter must de-energized or the following precautions must be taken:
      1. The piece of equipment must be provided with an electrical ground directly to the piece of equipment.
      2. While working near energized transmitters, a ground jumper cable must be attached to materials being handled by boom equipment when electrical charge may be induced. Crews must use nonconductive poles to connect the ground cable to the load.
      3. Combustible and flammable materials must be removed from the immediate area prior to operations.

# 4.0 Preventing Encroachment

* 1. Conduct a planning meeting with the Site Supervisor, operator, and crew who will be involved in the operation that is in close proximity to the overhead electrical hazard.
  2. If tag lines are used, they must be nonconductive.
  3. In addition to the elevated boundary, at least one of the following must be in place:
     1. A dedicated spotter who is in constant contact with the operator using visual or audible communication (eye contact with operator, radio or other electronic forms of communication, air horn, etc.), plus an elevated warning line, barricade, or line of signs, in view of the spotter, equipped with flags or similar high-visibility markings. The dedicated spotter must:

(I) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include: A clearly visible line painted on the ground; a clearly visible line on stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).

(II) Be positioned to effectively gauge the clearance distance.

(III) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator, in accordance with WAC 296-155-53406(13) (radio, telephone, or other electronic transmission of signals).

(IV) Give timely information to the operator so that the required clearance distance can be maintained.

Note:

To be considered a dedicated spotter, the requirements of WAC 296-155-53302 (Signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and the equipment, the load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the applicable minimum approach distance is not breached.

* + 1. A proximity alarm set to give the operator sufficient warning to prevent encroachment.
    2. A device that automatically warns the operator when to stop movement (i.e. a range control warning device).
    3. A device that limits range of movement.
  1. Assembly/disassembly of cranes below and within 50 feet of power lines is prohibited.
  2. Plastic guards placed on power lines are to be used as visual reference indicators only. They do not supply adequate protection to be considered guards.

# 5.0 Operations Inside Allowable Distances

* 1. If it is determined that the crane or piece of equipment could encroach inside the minimum distance during craning up to the maximum working radius or other normal operation, the following is required:
     1. Conduct a planning meeting with the Site Supervisor, operator, and crew who will be involved in the operation to review where the lines are and steps to prevent encroachment.
     2. Determine the minimum safe working distance from Table 1 according to the voltage of the line.
     3. Clearly place a warning line the required distance from the energized line so it is visible to the crane operator and/or spotter.
     4. A spotter is required to assist the operator.
     5. Spotter must:
        1. Be in direct line of sight with the operator.
        2. Position themselves so they can clearly see the marked clearances and can determine if the crane, excavator, etc. will encroach on its clearance.
        3. Notify the operator well in advance if the crane or load approach the required clearance.
     6. Signals between the spotter and the operator must be clearly defined and determined during the planning meeting.
  2. Refer to WAC 296-45 Electrical Workers when work on the power line is required or work within 10 feet of the power line is required. Contact Corporate Safety Manager Mike Ellis or Jeff Grade prior to working within 10 feet of the power line.
  3. No part of the crane, piece of equipment, load line or load is allowed below a power line unless the employer has confirmed that the utility owner has de- energized and visibly grounded the power line or the operation is outside of the required distance requirements.

6.0 Traveling Under Power lines

* + 1. When crane or piece of equipment are traveling under power lines or other overhead hazard, the following must be understood and followed:
    2. Follow clearance distances in Table 2 at all times while traveling near/under power lines or other overhead hazard.
    3. No part of the crane or piece of equipment will encroach on the clearance distances required (i.e. boom/mast and support systems will be lowered sufficiently to meet that requirement).
    4. Anticipate the effect of speed and terrain on the equipment height. Ensure clearance distances are maintained at all times. A safe path must be identified and used.
    5. Use a dedicated spotter.
    6. When traveling in conditions with poor visibility or at night, the power lines must be illuminated or other means of identifying their location must be used.

# 7.0 Training

* 1. All employees involved in the operations involving overhead hazards will be trained in the following:
     1. The procedures to be followed in the event of electrical contact with a power line:
        1. Information on the danger of electrocution from the operator simultaneously touching the crane or piece of equipment and the ground.
        2. Importance of the operator remaining inside the cab, except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab.
        3. Safest means of evacuating from the crane or piece of equipment if it is energized.
        4. The potential danger of the ground around the energized piece of equipment.
        5. The need for crew in the area to avoid approaching or touching the energized piece of equipment and load.
        6. Safe clearance distance from power lines.
     2. A power line is presumed to be uninsulated and energized unless the utility owner confirms it has been, and will continue to be de- energized, visibly grounded at the worksite, and insulated.
     3. The limitations of the insulating device, proximity alarm, and range control device (is used).
     4. The procedures how to properly ground equipment and the limitations of grounding.

# 8.0 References

29 CFR 1926.1400 (Nov 2010), Occupational Safety and Health Standards WAC 296-155 Part L, Occupational Health Standards (WISHA)

EM385-1-1, US Army Corps of Engineers

Overton Safety Training, Inc.

# 9.0 Attachments

Table 1 Minimum Clearance Distances

Table 2 Minimum Clearance Distances While Traveling with No Load and

Boom/Mast Lowered

AISH 37-A Overhead Hazard Checklist

**Table 1- Minimum Clearance Distances**

|  |  |
| --- | --- |
| **Voltage (nominal, kV)** | **Clearance Distance (feet)** |
| Up to 50 | 10 |
| 51-200 | 15 |
| 201-345 | 20 |
| 346-500 | 25 |
| 501-750 | 35 |
| 751-1,000 | 45 |
| 1,001 and up | Established by the utility owner or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution |

**Table 2**

**Minimum Clearance Distances While Traveling with No Load and Boom/Mast Lowered**

|  |  |
| --- | --- |
| **Voltage (nominal, kV)** | **Clearance Distance (feet) while traveling with boom lowered** |
| Up to 0.75 | 4 |
| 0.76-50 | 6 |
| 51-345 | 10 |
| 346-750 | 16 |
| 751-1,000 | 20 |
| 1,001 and up | Established by the utility owner or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution |

**AISH 37-A Overhead Hazard Checklist**

Project Name Project Number Date\_

**SCOPE OF WORK**

Activity Equipment Used:  Crane  Excavator  Fork Lift  Arial Lift  Other: What is the working radius?

What is the minimum approach distance from power line permitted based on AISH Table 1? Feet

If **any part** of the equipment or load will get closer than 20 feet (up to 345 kV) or 50 feet (exceeds 345 kV) during the work activity then contact the utility owner and complete this form.

***\*NOTE: The approach distance must be equal to or greater than the working radius.***

**HAZARD INFORMATION**

Utility Owner Date Contacted

Date Received Response

Line Voltage kV Line De-energized? YES NO\*

\*If No, what is the minimum approach distance permitted AISH 37 Table 1? Feet

Travel under power line required? YES\* NO \*Clearance distances identified in AISH 37 Table 2: Feet Will any part of equipment encroach clearance distances while traveling under power lines?  YES  NO

**CONTROLS**

Controls in place to ensure no part of equipment gets closer than allowable distances:

 Dedicated Spotter and Controlled Work Zone Spotter and Operator Communication System

 Proximity Alarm  Device that limits range of motion  Other (describe in detail)

***\*NOTE: Plastic guards placed on power lines are NOT to be used as a control method.***

|  |  |  |  |
| --- | --- | --- | --- |
| **OTHER** | **YES** | **NO** | **NA** |
| Pre-task plan meeting conducted prior to operation? |  |  |  |
| If line is de-energized, is it visibly grounded? |  |  |  |
| Non-conductive tag lines used? |  |  |  |
| Physical elevated boundaries set up to delineate work zone? |  |  |  |
| Site cleared of all non-essential personnel? |  |  |  |
| At least **1** electrical hazard sign posted **in the cab** where operator can see it? |  |  |  |
| At least **2** electrical hazard signs posted on boundaries **outside of the equipment**? |  |  |  |
| Materials prohibited from being stored under power lines? |  |  |  |
| Dedicated Spotter in a position that allows them to be in constant contact with the operator? |  |  |  |
| Dedicated Spotter used at all times while traveling under power lines? |  |  |  |
| Terrain taken into account for all travel under power lines? |  |  |  |
| Are all personnel involved trained on AISH 37 requirements? |  |  |  |

**TRAINING**

All personnel involved trained on Apollo AISH 37 Procedure **and** Spotter shall be a Certified Signal Person

**Supervisor** (print name) Signature\_ **Equipment Operator** (print name) Signature **Certified Spotter** (print name) Signature