Safe Work Practices
Emergency Action Plan

1. Evaluate immediate situation without endangering yourself.
2. Alert other personnel. Evacuate if necessary.
3. Secure the work area as appropriate.
4. Report incident to appropriate supervision.

Emergency Contact Numbers

Supervisor

Work _______________________
Cell _______________________
Other _______________________

EHS Professional

Work _______________________
Cell _______________________

Local Emergency Numbers

Police/Medic/Fire _______________________
Location/Plant emergency number _______________________
Safety Vision

Duke Energy employees and contractors at every level demonstrate personal commitment to continuous safety improvement, resulting in a zero injury and zero work-related illness culture.

Safety Principles

- Safety begins at the top.
- Injuries and work-related illnesses are preventable.
- Identifying and minimizing safety and health risks are priorities.
- Personal ownership for safety and looking out for others are essential.
- Openness, feedback and trust are keys to safety success.
- Safety is good business and a critical aspect of a high performance organization.
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Abrasive Blasting/Spray Coatings

Abrasive Blasting

1. Inspect abrasive blasting equipment before use. Check the static pressure drop of the exhaust ventilation system for the abrasive blasting room or booth.

2. Frequently check exhaust ventilation filters. Replace per manufacturer’s instructions.

3. Ensure dust does not accumulate on the floor and aisles outside the blasting enclosure. Keep walkways clear of steel shot or similar abrasive which may create a slipping hazard.

4. Use signs and/or ribbons to designate temporary blasting areas.

5. Before removing blasting hood, brush, dust, or vacuum abrasives or other contaminants from hood and cape.

6. At the end of the work shift, shower and change clothes when necessary to remove contaminants.

7. Before performing work to prevent build up of static electricity, ensure blast hose is grounded to the pot.

8. Ensure blast equipment is maintained by qualified personnel familiar with the hazards.

9. Use the following personal protective equipment: work gloves, hearing protection, safety glasses, NIOSH-approved air-supplied blast hoods with capes or aprons.

10. Refer to the Lead in Construction Program in the EHS Manual for requirements related to training where exposure to lead is an issue.

Spray Coatings

1. Be familiar with the Material Safety Data Sheet for spray coating materials.
2. Ensure ventilation is adequate or wear respiratory protection.

3. Before each use, check the static pressure drop of the exhaust ventilation system for the spray room or booth. Replace per manufacturer’s instructions.

4. Designate temporary spray painting areas by using signs or warning tape.

5. Eliminate ignition sources in spray painting areas.

6. Inspect spray painting equipment before use.

7. At the end of the work shift, shower and change clothing when necessary to remove contaminants.

8. Ensure airless spray guns that atomize paints and fluids at high pressures (1000 lbs. or more per sq. in.) are equipped with automatic or visible manual safety devices to prevent release of the paint or fluid until the safety device is manually released.

9. Use the following personal protective equipment: eye protection, respiratory protection as necessary, solvent-resistant gloves.
Asbestos Management

Asbestos work activities will comply with the Duke Energy Asbestos Abatement and Air Monitoring Standards. The work practices noted below are generic and do not include all requirements for contractors performing asbestos activities.

1. Personnel working in facilities must be aware of the types of materials known or suspect to contain asbestos.

2. Treat any suspect materials as asbestos-containing unless bulk samples or documentation is on file disputing the presence of asbestos.

3. Stop work if at any time you are unsure if the material you are working on contains asbestos. Do not resume work until the material has been sampled and verified as non-asbestos.

4. Ensure you have current training in the appropriate asbestos discipline (Supervisor, Worker, Inspector, and Project Designer). Some states may use different terms for similar functions.

5. When required by the applicable state agency, maintain current accreditations and/or licenses per discipline.

6. If you are working on known or suspect asbestos use identified work practices, engineering controls, and PPE including respirators based on the work activity being performed.

7. Regardless of exposure levels always:
   a. Use HEPA vacuums to collect dust/debris.
   b. Use wet methods to control exposures unless the methods create an electrical hazard or a slipping hazard in roofing operations.
   c. Promptly clean up ACM.

8. Regardless of exposure levels, the following asbestos work activities are prohibited:
   a. High-speed abrasive disk saws without HEPA-filtered exhaust
b. Compressed air to remove asbestos

c. Dry sweeping of ACM

d. Employee rotation to reduce asbestos exposures

9. Regulated areas, including appropriate signage, must be established for Class I, II or III work activities.

10. Supervision of asbestos related jobs must be conducted by a “competent person” based on the level of asbestos work.

11. Dependent upon the level of asbestos work activity and the material being disturbed, showers may be required at the completion of the task or completion of the shift. Waste water from asbestos showers must be collected and filtered.

12. If you perform asbestos Class I, II or III work activities for 30 days or more per year or are exposed above the Permissible Exposure Limit (PEL) or Excursion Limit (EL) you must be in an asbestos medical surveillance program.

13. If required to use a respirator, ensure you follow the requirements for your respiratory protection program.


15. All ACM waste must be labeled appropriately, stored in secure ACM waste storage areas and disposed of in Duke Energy approved landfills.
Ash, Coal, and Limestone Handling Safe Work Practices

Ash Handling

1. When inserting or using a rod in a furnace, keep the rod away from the body to avoid being struck if falling ash or slag should cause the rod to kick upward.

2. A pipe shall not be used for deslagging operations unless the pipe is sealed or connected to an air or water supply.

3. All rods in the vicinity of the area in which they are used should be assumed to be hot and treated as such.

4. Follow the requirements in the Hot Ash Procedure (Regulated Generation).

Limestone Handling

Follow all requirements in Rail Operations category.

Coal Handling Operations

1. Ensure the Material Safety Data Sheet (MSDS) for the specific type of coal used is available and reviewed as needed.

2. Wear eye protection (goggles OR face shield and goggles) when cleaning out chutes, unstopping feeders, cleaning equipment, and when working in other areas where forced air is used or wind or building draft conditions exist.

3. When dusty conditions (visible dust) exist, wear approved respiratory protection.

4. Wear hard hats at all times except in scale house and control room.

5. While working in the crusher, coal shakeout, or locomotive, wear hearing protection if noise levels are above 85 dBA.

6. When working around vibrating feeders that are in service, wear
Safe Work Practices

hearing protection.

7. Use the following required personal protective equipment:
   a. Hard hat
   b. ANSI-approved safety glasses with sideshields
   c. Work gloves
   d. ASTM/ANSI-approved protective footwear

8. Regardless of coal pile height, identify location of reclaim hoppers/feeders. If necessary, use 2 reference points.

9. Place “Danger - Live Pile” signage on feeder sides of coal pile.

10. Educate affected employees and vendors of reclaim hopper/feeder locations.

11. Use two-way radios at all times for coal handling operations.

12. At the beginning of each shift, operate feeders for approximately 15 minutes.

13. When operating bulldozers to move coal piles, take appropriate precautions to prevent bridging of the coal.

14. Be aware of bulldozer’s proximity to coal pile edges.

15. Ensure bulldozers have a working back-up alarm.

16. Unauthorized personnel shall not enter Coal Handling areas without first checking in with Coal Handling Control Room.

17. Personnel shall not enter the coal pile without a 2-way radio.

18. Do not work inside pulverizing fuel equipment until it has been thoroughly purged or the pulverized coal is properly controlled by use of a wetting agent or some other suitable means.

19. Before a coal bunker is entered, the associated mill feeder shall be physically rendered inoperative and tagged in accordance with lockout/tagout procedures. Confined-space procedures shall be followed.
20. Employees entering a bunker for the purpose of dislodging coal or performing an inspection shall wear an approved full body harness with a life line attached. The life line shall be secured to a fixed support outside the bunker and another employee stationed to render assistance if needed.

21. When cleaning coal in a bunker, employees should not work from a position under the lodged coal.

22. Employees shall not smoke in coal-storage buildings or buildings housing coal crushing and handling equipment.

23. In coal handling areas, the accumulation of coal dust shall be minimized and potential sources of ignition eliminated.

Coal Handling Processes

1. Coal handling areas are considered Class II hazardous locations and the following processes apply:
   
   a. Perform regular cleaning on walls, floor and horizontal and vertical surfaces such as equipment, ducts, pipes, hoods ledges, beams etc.

   b. Eliminate or safely control all ignition sources. Electrical equipment and wiring shall be installed as required by the National Electrical Code, Article 502, Class II Locations.

   c. Equipment, wiring methods and installations of equipment in hazardous (classified) locations shall be
      
      i. Intrinsically safe; OR.

      ii. Approved for the hazardous location; OR.

      iii. Safe for the hazardous location.

2. Plants shall ensure that classified electrical equipment is maintained in proper condition.
Car Shaker and Dumpers

1. Use only hammers, bars, or suitable company-approved tools to open and close hopper bottom cars.
2. Before climbing into the car, ensure car shakers are shut off.
3. Do not move a car until the shaker has been shut off and raised from the car and all persons are clear of the car.
4. When engaged in car shaker operations, wear suitable eye, hearing, head, hand, and respiratory protection as prevailing conditions dictate.
5. Before operating a rotary car dumper, ensure the car is properly spotted and uncoupled from other cars and the clamps are properly positioned.
6. When a rotary dumper is in operation, stand clear.
7. Ensure rotary dumpers are in upright position when full rail cars are approaching.
8. When walking between or around the end of coal cars at unloading hoppers, use caution.
9. When spotting in the unloading hopper area, do not ride on the top or on the side of the coal car.
10. When working inside coal cars to break up frozen coal, wear fall arrest equipment with lifelines attached outside the car.
11. When pulling cars off unloading hoppers with air hoists, use caution. Check cables regularly for any defects.
12. Before riding empty cars from the hopper area, test the brakes.
13. Sound locomotive horn prior to moving it whether attached to cars or not.
14. Sound warning before discharging empty cars from dumper.
Conveyers and Crushers

1. Stay clear of conveyers as they may start anytime.
2. Before starting conveying equipment, sound a warning.
3. Do not ride on a moving conveyer belt.
4. Cross over or under conveyers only where permanent walkways with railings have been installed.
5. While the belt is operating, do not attempt to clear a blocked feeder, conveyer, or crusher or to loosen or clean any material around conveyer rollers unless the equipment is de-energized and tagged in accordance with the lockout/tagout procedure.
6. Do not clean around conveyor rollers while the belt is in operation.
7. Ensure all belt conveyers are equipped with emergency stop cords for their entire exposed length.
8. Do not make repairs until the electric system is shut off, locked, and tagged in accordance with the lockout/tagout procedure.
9. Coal dust shall not be cleaned up in a manner that could create a hazardous, dusty atmosphere. Use of compressed air is prohibited.

Barge Operations

1. Employees working over or near water shall wear a US Coast Guard approved personal floatation device (PFD/life jacket).
2. Prior to each use, personal flotation devices shall be inspected for defects that may compromise their integrity. If a defect is discovered, the device shall be replaced.
3. All gangplanks shall be appropriately positioned and secured.
4. Employees shall not run and shall never jump from the work dock to a barge or between barges.
5. Employees shall wear personal fall arrest equipment (harness) in addition to a life jacket while taking barge displacement.
measurements. The personal fall arrest equipment shall be inspected prior to each use, and if any defects are found, it shall be replaced.

6. Employees shall always step over manhole covers or wing tank lids on the gunwales of a barge. Never stop on manhole covers or wind tank lids.

7. Employees shall keep hands, feet, and body from between the barges at all times.

8. Employees shall stand clear of any lines or wires that are strained, and they shall not straddle wires when tightening them. Employees shall remain on the outside of all fore and aft cables.

9. Employees shall not lean over the edge of the boat or barge to grab a line. Use a pike pole instead.

10. Swimming is prohibited.

11. An employee shall not enter a barge that is being unloaded, unless he/she is in full view of the crane operator or signalperson.

12. Before work takes place on a barge, the gunwales and end decks shall be cleared of loose coal.

13. Employees engaged in moving, docking, or unloading coal barges shall become familiar with the procedures, hand signals, and rope knots used in their work. Employees shall utilize all required PPE for these activities.

**Railroad Locomotives**

1. Ensure that locomotives are inspected each shift and that inspections are documented.

2. Ensure operators are authorized, trained and qualified, can demonstrate skills, and are familiar with the function, limitations, capacities, inspection, and operation of the locomotive.

3. Before moving a locomotive, sound a warning bell or whistle. When approaching a walkway or driveway, always sound the warning.
4. Do not move the locomotive until the flagman gives a radio or signal direction. The operator of a locomotive may move the locomotive only after being given a signal or communication to do so from a designated person.

5. Ensure the flagman uses 2-way radios or adequate signaling devices and standard railroad hand signals. Employees shall carefully follow all radio instructions and signals. If instructions or signals are not fully understood, do not move the locomotive until clarification has been made.

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<th>For this signal...</th>
<th>Do This...</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOP</td>
<td>Horizontally swing the signal device at a right angle to the track.</td>
</tr>
<tr>
<td>REDUCE SPEED</td>
<td>Swing the signal device at a slight horizontal movement at arm’s length at a right angle to the track.</td>
</tr>
<tr>
<td>PROCEED</td>
<td>Vertically raise and lower the signal device.</td>
</tr>
<tr>
<td>RELEASE THE AIR BRAKES</td>
<td>Hold the signal device at arm’s length above your head</td>
</tr>
<tr>
<td>BACK</td>
<td>Vertically swing the signal device in a circle at a right angle to the track.</td>
</tr>
<tr>
<td>APPLY AIR BRAKES</td>
<td>Horizontally swing the signal device above your head.</td>
</tr>
</tbody>
</table>

6. Do not operate the locomotive until air brake system is charged and tested.

7. Do not exceed the recommended number of cars in a “cut” that could exceed safe pulling capacity of the locomotive.

8. If remote controls are used to move locomotives ensure they are for the designated locomotive, are in proper working order and are protected from transmittal interferences.

9. Employees controlling locomotives with remote controls shall remain
Safe Work Practices

within eyesight of the locomotive at all times and shall maintain control of the remote control unit.

10. A bell, whistle, or other warning device shall be sounded before any railroad equipment is moved.

11. The operator shall bring the train to a full stop when communications are interrupted with the designated person at ground level.

12. The operator shall sound a warning device when approaching any area where there is potential pedestrian and/or vehicle traffic.

13. Railroad equipment shall be brought to a full stop at a visually obstructed crossing, and a designated person at ground level shall give warning to others approaching the crossing.

14. When an opening in the train has been made at a walkway or crossing, recoupling of cars shall be done only when a designated person is at the location to see that it is safe to proceed.

15. Employees shall not ride on the leading footboard of a locomotive, between or on the leading end of cars.

16. Employees shall not board or leave a train except when it is stopped.

17. Railroad equipment shall be boarded at the grab iron and step at the side of a locomotive or car.

18. Employees may adjust coupling devices only when cars and locomotive are stopped and brakes have been set.

19. When a locomotive is left unattended, all necessary precautions shall be taken to prevent its movement.

20. The operator shall govern the speed of the train based on existing conditions, being prepared to stop for any obstruction. Maximum speed shall not exceed 15 miles per hour within yard limits.

21. When possible, train automatic brake systems should be used.

22. When it is necessary to ride on railroad cars, employees shall face in the direction of travel. They shall watch for close clearances and
obstructions and take the necessary precautions.

23. When unloading coal cars, employees shall use a hammer, car door wrench handle, or some similar tool to trip the locking device.

**Railroad Cars**

1. When working in the coal-handling area, wear ASTM/ANSI-approved protective footwear with leather uppers or with some other suitable nonpermeable material and with a heel 1/2 to 1 1/2 in. high.

2. Park cars near a switch point so as to provide sufficient clearance for passing cars.

3. Do not move cars with employees working inside.

4. Before riding on the side of a car, ensure sufficient side clearance along the tracks or between the car and adjacent buildings.

5. Employees shall not board or leave a train except when it is stopped.

6. Where cars could be set in motion, do not crawl under parked cars or walk between uncoupled cars.

7. Before moving cars with rope or cable, warn employees to stand clear of the towing device.

**Railroad Switches**

1. Ensure the proper switch is being operated to obtain the desired positioning of the tracks.
   
a. Release the latch and, while bending the knees, grab the handle with both hands.
   
b. Lift with slow, even pressure so as not to lose balance.
   
c. Push lever down smoothly and firmly; use leg muscles, not back.
   
d. Double-check keeper and switch points, and ensure there is no misalignment caused by trash and/or rods between points or rails.
Railway Operations

1. Do not walk, stand, or sit on tracks except when necessary to properly perform work.

2. Cross or walk on tracks at a safe distance from cars or locomotives.

3. Expect trains, engines, and cars to move at any time, on any track, and in either direction.

4. Do not crawl under or work beneath cars or locomotives, unless the wheels have been blocked in both directions and warning flags or signs have been placed at both ends.

5. When performing thawing operation using oil-fired torches, wear full-face shield, safety glasses, and work gloves.

6. Ensure fire protection and first aid equipment are available in open-flame thawing areas.
Bloodborne Pathogens

1. Prevent contact with the eyes, mouth, mucous membranes and non-intact skin with blood or other potentially infectious body fluids.

2. If possible, provide assistance to injured personnel without exposing yourself to fluids which can be infected with bloodborne pathogens.

3. Do not handle bloody clothing or contact contaminated surfaces unless you are trained and use proper personal protective equipment.

4. Report to supervisor any exposure to infectious materials.

5. Follow all established procedures and work practices to prevent contact with the eyes, mouth, mucous membranes and non-intact skin with potentially infectious fluids.

6. Use the prescribed engineering controls and personal protective equipment.

7. When unsafe conditions are observed, notify appropriate personnel immediately.
Compressed Gas Cylinder Storage

1. Flammable gas cylinders must not be stored in or near access or egress passage ways.

2. Compressed gas cylinders must be stored and transported with the valves closed and valve protection caps in place. All cylinders shall be handled carefully. Rough handling, knocks, or falls may damage the cylinder, valve, or safety devices and cause leakage.

3. Compressed gas containers, cylinders, and tanks in use or in storage shall be secured to prevent them from falling or being knocked over by securing them to a cart, framework or fixed object by means of a substantial chain or cable.

4. Warning signs indicating cylinder contents (i.e. “Oxygen”) as well as providing specific instructions (i.e. “No Smoking”) shall be posted as appropriate where compressed gas cylinders are stored.

5. Identify, tag, and remove from service damaged cylinders and notify supplier. Under no circumstances shall employees attempt to repair valves found to be defective or stuck.

6. Ensure compressed gas cylinders are properly labeled and identified. Whenever possible this labeling shall be on the shoulder of the cylinder and shall not be readily removable or defaced. This method conforms to ANSI Z48.1-1954.

7. When transporting cylinders, keep them upright and secured. Use a wheeled cart or rack with fork skids to transport cylinders.

8. Do not use valve protection caps for lifting cylinders. Additionally, bars shall not be used under valves or caps to pry cylinders loose when frozen. Warm water, not boiling water, shall be used to thaw cylinders, valves or manifolds.

9. Before lifting or moving cylinders, ensure valve protection caps are in place and hand tight. Cylinders shall be transported by either: rolling on bottom edge; or by use of mechanical lifting devices such as
10. Compressed gas cylinders may be stored in the sun but storage area temperatures must not exceed 125 °F.

11. Tag empty cylinders “EMPTY” or “MT”. Keep valves closed and protective caps in place. Empty cylinders must be treated as “full” relative to storage.

12. Do not smoke, weld or use open flames near compressed gases that are flammable, oxidizing, or reactive.

13. Oxygen and acetylene cylinders must be stored on a cart or secured at a point 2/3 of the height of the cylinder.

14. Oxygen cylinders in storage, even if empty, must be separated from fuel-gas cylinders or combustible materials (especially petroleum products), by a distance of 20 feet or a 1/2 hour fire-rated barrier 5 feet high. See item 18 for exceptions.

15. Oxygen and fuel gas cylinders must not be used or stored where they could become energized by a surrounding electrical circuit/installation. Cylinders shall be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits such as for arc welding machines. Any practice such as tapping an electrode against a cylinder to strike an arc, shall be prohibited.

16. Cylinders shall be kept far enough away from welding or cutting operations so that sparks, hot slag, or flame will not reach them, or fire resistant shielding shall be provided.

17. The valves, torches, and regulators of oxygen and fuel gas cylinders must be kept clean and free of oils, grease, and other combustibles. Oxygen cylinders or apparatus shall not be handled with oily hands or gloves. A jet of oxygen must never be permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

18. A single oxygen and a single acetylene cylinder may be stored together and considered ready for use or in use, if all of the following conditions are met:
<table>
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<tr>
<th>On a Cart</th>
<th>Not On a Cart</th>
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</thead>
<tbody>
<tr>
<td>(1) No more than a single acetylene cylinder and a single oxygen cylinder are on a cylinder cart. The cylinder cart must be specifically designed to hold/carry oxygen and acetylene cylinders in the upright position. The cylinders must be securely held to the cart (such as by straps, chains or other securing device).</td>
<td>(1) The only cylinders in the area for which the storage requirements apply but are not met are a single acetylene cylinder and a single oxygen cylinder.</td>
</tr>
<tr>
<td>(2) The cart is on a firm, level surface.</td>
<td>(2) Both cylinders are firmly attached (such as by chains or other secure means) in an upright position to a substantial vertical surface (such as a wall, steel column, exposed wall studs).</td>
</tr>
<tr>
<td>(3) The cart is not in an area where there is a reasonably foreseeable risk of being struck by vehicles, equipment, or materials (such as in a pathway for vehicles on a construction site or a traffic aisle in a plant).</td>
<td>(3) The cylinders are not in an area where there is a reasonably foreseeable risk of their being struck by vehicles, equipment, or materials (such as in a pathway for vehicles on a construction site or traffic aisle in a plant).</td>
</tr>
<tr>
<td>(4) Both cylinders either have valves closed with protection caps on; or are connected to a properly functioning regulator and cylinder valves closed.</td>
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</tr>
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</table>

19. If the conditions in #18 above cannot be met, do all of the following:
   a. Remove the cylinders from the dolly cart.
   b. Return them to approved storage locations as outlined in #14 of this section.

20. Each facility/location should determine the number of oxygen/acetylene dolly carts necessary for reasonably anticipated planned
and emergency work. The number may increase during outages and other major work activities. Management will ensure that the number of loaded dolly carts does not exceed the thresholds established.

**Acetylene**

OSHA adopted these requirements for acetylene on 12/1/2009. They are taken from CGA G-1 2009 Acetylene:

Storing acetylene:

1. Cylinders should always be stored in an assigned location.
2. Store acetylene cylinders in a dry and well-ventilated location.
3. Cylinders shall not be stored at temperatures exceeding 125F or used at temperatures above 120F. Do not store near sources of heat. Do not store where heavy moving objects might strike the cylinders.
4. Acetylene cylinders shall not be stored in close proximity to oxygen cylinders. Unless separated by a minimum distance of 20 feet, a noncombustible partition 5 feet high having a fire resistive rating of at least 1/2 hour shall be placed between stored acetylene cylinders and oxygen cylinders.
5. Acetylene cylinders stored inside a building shall be limited to total capacity of 2500 ft3.
6. Valve protection caps shall be mechanically attached except when cylinders are in actual use.
7. Post conspicuous signs forbidding smoking or the carrying of open flame.
8. Store empty cylinders separate from full cylinders.
9. Keep valves closed when not in use and when the cylinders are empty.
10. Acetylene cylinders should be stored in a vertical position. Use in a secured vertical position enhances safety by providing for easy access to the valve and regulator assembly.
11. When stored outdoors, protect bottom from corrosion. Protect against accumulations of ice and snow. Screen from direct rays of the sun.

12. Do not store acetylene cylinders, particularly small cylinders used for soldering, in confined spaces such as drawers, closets, unventilated cabinets, automobile trunks, or toolboxes. Acetylene cylinders should not be stored or transported in automobiles or any enclosed vehicle.

Withdrawning acetylene from cylinders:

1. Do not use acetylene at pressure exceeding 15 psig.
2. Use acetylene in a secured upright position. Use in horizontal position does not make the acetylene less stable, but it does prevent ease of access to the valve and regulator assembly.
3. Never use wrenches or other tools for opening or closing valves except those provided by the valve or acetylene manufacturer.
4. Visually examine the CGA connection and remove visible contamination before connecting the regulator. Clean out the contaminant using nitrogen, air or a clean rag.
5. Be sure that connections are gas-tight.
6. Open acetylene cylinder valve slowly. Never use hammer or mallet to open or close a valve.
7. Never apply a torch to the side of a cylinder to raise the pressure.
8. Withdrawal rate of 1/7 of the cylinder capacity per hour is generally acceptable.
9. To minimize withdrawal of liquid solvent in applications that are more sensitive to solvent carry-over, acetylene should be withdrawn from the cylinder at a rate not to exceed 1/10 of the capacity of the cylinder per hour during intermittent use, and for withdrawal of the contents on a continuous basis, no more than 1/15 of the capacity per hour.
10. Never open a valve without proper attachments (regulator and torch or regulator and flow restriction).
Confined Space Entry

At Duke Energy facilities or sites that have confined spaces that employees or contractors may enter for any reason or duration, to perform inspections, tests, examinations, or maintenance work, the following requirements must be met. See Power Delivery procedures for entry into manholes and vaults.

**General**

1. Do not enter any confined space without (at a minimum) a written certification from a qualified Hazard Analyzer (completed CS Evaluation Report) and your supervisor’s knowledge and approval.

2. Do not enter a confined space unless there is a business need to do so.

3. All employees involved in confined space entries must be trained according to the level of their confined space entry responsibilities.

4. Follow the location Confined Space Entry Procedures and Processes.

5. For Permit-Required Confined Spaces, ensure an Entry Supervisor is designated to oversee entry and fulfill Duke Energy’s duty to reduce any serious hazard to the extent feasible or eliminate it.

6. For augmented workforce Contractors or subs working at generating facilities, follow the location’s Confined Space program and procedures.

7. For Contractors and subs working at locations other than generation facilities; after approval by a Duke Energy representative; the contract employees will follow an agreed upon Confined Space program and procedure.

**Entry Supervisors (Applies to Permit-Required Confined Spaces)**

1. Review the Hazard Evaluation Report for the confined space to be entered and conduct an on-site pre-entry hazard evaluation of the space to be entered. Ensure that you know:
Safe Work Practices

1. Identify the hazards:
   a. Potential atmospheric and physical hazards of entry
   b. Hazards to the body and routes of entry, e.g., breathing, skin contact, or swallowing
   c. Signs and/or symptoms resulting from exposure to the hazardous atmosphere
   d. Consequences of exposure to the hazardous atmosphere

2. Eliminate as many hazards as possible

3. Determine the required entry procedure to be used based on any remaining hazards or potential hazards. Reclassify as necessary.

4. Verify that:
   a. All tests specified by the permit have been conducted
   b. All procedures and equipment specified by the permit are in place
   c. The appropriate entries have been made on the permit

5. Ensure that any rescue personnel and equipment is readily available and set up as required.

6. Ensure that pre-entry air monitoring is conducted as close to initial entry as possible, but never more than 30 minutes prior to initial entry into the confined space.

7. Complete and sign a Confined Space Evaluation Report and the Confined Space Entry Permit or Alternate Entry Evaluation form and post it at the space entry portal.

8. Establish communication method(s) for the entrants and the attendant. The attendant and entrants must keep in contact with one another by voice, radio or tag line until entry is terminated.

9. Ensure all hazardous energy sources are controlled and lockout/tagout (clearance) performed as required.

10. Conduct pre-job briefings to familiarize personnel with safety and health hazards.
11. Prepare equipment needed for work inside the permit space.
12. Post an attendant at the designated entry point.
13. Ventilate the space to minimize or eliminate atmospheric hazards.
14. During the entry activity, ensure that periodic or continuous air monitoring is conducted as required. Air monitors must be used in the vicinity of the work.
15. Ensure that entrants wear the required full body harness with attached life line during a permit entry in accordance with this program.
16. Following the site process, ensure that the Control Room or Operations is notified of the start and completion of the entry activity.
17. Ensure that entry operations remain consistent with what is written on the permit and maintain acceptable entry conditions.
18. After verifying that the space is safe for entry, sign the permit authorizing entry into the space.
19. Remain readily available so as to be able to immediately respond to the space if needed. The Entry Supervisor does not need to be at the space at all times.
20. Ensure that an attendant is present as required while the entry activity is in progress.
21. Transfer the Entry Supervisor responsibilities to another individual as long as the individual taking over has been trained as an Entry Supervisor and is knowledgeable of the work process(s) being conducted in the space.
22. Terminate the entry activity as required and return the completed entry permit to the location or person per the site’s permit process.

Attendant (Applies to Permit-Required Confined Spaces)

1. Review the permit, certification, or any other documents posted at the entry point.
2. Know the:
   a. Atmospheric and physical hazards associated with the entry
   b. Hazards to the body and routes of entry, e.g., breathing, skin contact, or swallowing
   c. Signs and/or symptoms resulting from exposure to the hazardous atmosphere
   d. Consequences of exposure to the hazardous atmosphere
3. Be aware of possible behavioral effects of hazard exposure in entrants.
4. Continuously maintain an accurate count of entrants in the space.
5. Remain outside the permit space at all times while work is being performed inside until relieved by another attendant.
6. Maintain communication with entrants.
7. Monitor activities both inside and outside the space to determine whether it is safe for entrants to remain inside.
8. Order evacuation of the space if any of the following conditions occur:
   a. A prohibited condition is detected, e.g., air monitor alarm, unauthorized work activity
   b. Behavioral effects resulting from a hazard exposure is detected in any of the entrants.
   c. A situation is detected outside the space that could endanger the entrants.
   d. The attendant is unable to effectively and/or safely perform all the required duties.
9. Summon rescue and/or other emergency services if you determine that entrants may need assistance escaping from the space. Note: Do not to attempt an entry rescue unless properly trained in confined space rescue and unless another attendant is present to assume the attendant duties and sufficient personnel are present to conduct entry rescue.
10. Do the following when unauthorized persons approach or attempt to enter a permit space while work is in progress:
   a. Warn the person to stay away from the permit space
   b. If the person has entered, advise person to exit the permit space immediately
   c. Inform entrants and the Entry Supervisor that an unauthorized person has entered the permit space

11. Perform or assist in non-entry rescues as specified by the Confined Space Program, but only if trained to do so.

12. Do not perform any duties that might interfere with your primary duty of monitoring and protecting the entrants.

Hazard Analyzer

1. Analyze the confined space for actual or potential hazards and document their presence and mitigation (or control) on the Confined Space Evaluation Report.

2. Classify the confined space based on the actual or potential hazards present. The completed CS Evaluation Report will serve as a written certification when signed by a qualified Hazard Analyzer.

Entrants

1. Prior to entry into a confined space, review the Entry Permit, written certification (CS Evaluation Report), or any other documents posted at the entry point.

2. Know the:
   a. Atmospheric and physical hazards associated with the entry
   b. Hazards to the body and routes of entry, e.g., breathing, skin contact, or swallowing
   c. Signs and/or symptoms resulting from exposure to the hazardous atmosphere
Safe Work Practices

d. Consequences of exposure to the hazardous atmosphere.

3. Do not enter any confined space without your supervisor’s knowledge and approval.

4. Follow the site’s procedure and associated work practices.

5. Ensure you have the appropriate level of training.

6. Review the applicable confined space evaluation form, prior to entry.

7. Don harnesses and lifelines for non-entry retrieval. A harness or lifeline is not required if it creates a greater hazard to the rescue of an entrant; wristlets would be an acceptable alternative. Example: transformers and/or circuit-breakers

8. Don needed personal protective equipment (e.g., respirators, protective clothing).

9. Sign onto the appropriate entry form as required.

10. Perform a Level I Assessment (tail gate) prior to entry. Consider the work activity associated with the confined space entry.

11. Be familiar with the site emergency response process.

12. Notify fellow entrants and the attendant immediately when unsafe conditions are observed.

Contractor (Turnkey) Supervision

1. Ensure, and be able to demonstrate to the Duke Energy Contract Manager and/or Job Sponsor, that all contractor employees have successfully completed the required training for their assigned duties and responsibilities for working in confined spaces.

2. Ensure that the site’s Confined Space Entry processes and procedures are followed.

References:

OSHA 29CFR 1910.146
Cranes and Rigging

Housekeeping

1. Crane cabs and operator walk paths shall be kept clean and all litter removed at the end of each operation period.

2. Areas around the load pickup and set down points shall be kept free of loose objects, material, etc., which may interfere with the safe operation of the lift.

Using Cranes to Lift Individuals

When it is the safest way to perform work, lifting individuals using personnel baskets attached to a crane is allowed but shall be in strict compliance with OSHA requirements found in 1926.1427.

Keeping Clear of the Load

1. Hoist routes that minimize exposure of employees to hoisted loads must be used.

2. While the operator is not moving a suspended load, no employee must be within the fall zone, except for employees:
   a. Engaged in hooking, unhooking, or guiding a load.
   b. Engaged in the initial attachment of the load to a component or structure.

3. When employees are engaged in hooking, unhooking or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, the materials being hoisted must be rigged to prevent unintentional displacement; hooks with self-closing latches are required; and the materials must be rigged by a qualified rigger.
Rigging and Flagging

1. The rigger is responsible for inspection and assembly of the rigging hardware and lifting equipment as well as securing the load to the rigging hardware and lifting equipment.
2. The rigger shall inform the flagger that the load is ready to lift.
3. The flagger is responsible for ensuring that the load is rigged satisfactorily, either by personal inspection or by verification with the rigger.
4. The flagger is responsible for directing the lift operation and communication with the lift equipment operator.
5. The flagger should wear a reflective vest and/or reflective gloves.
6. Flagger for mobile cranes must be a qualified signal person.

Flagging and Emergency Stop

1. Throughout the entire lift, the equipment operator shall accept communications only from the designated flagger, except in emergency situations.
2. The operator shall accept an emergency stop signal from anyone.
3. When there is a concern as to safety, the mobile crane operator has the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.

Nighttime Operations

1. Nighttime operations shall be conducted with adequate illumination of the pickup area, setdown area, the flagger, the boom tip, and the load path (if the load path is not previously determined to be clear).
2. Nighttime crane operations where contact with energized electrical lines is possible shall not be made unless such lines can be adequately illuminated, de-energized or protected.
3. The crane operator shall determine the required illumination needed for safe operation.
Mobile Crane Setup

1. Cranes must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that the equipment manufacturer’s specifications for adequate support and degree of level are met.

2. The controlling entity (i.e. prime contractor, general contractor, construction manager or owner) must ensure that ground preparations necessary are provided and inform the crane operator of the location of hazards beneath the equipment set up area such as voids, tanks, utilities if those hazards are identified in drawings.

3. Adequate foundations for outriggers shall be determined by observation of the location area, available drawings and/or discussions with engineering.

4. Before extending the outriggers, check to see that all personnel are clear of area where the outrigger foot will be placed. To avoid injury to co-workers from contact with the outrigger, take actions such as: pre-job briefing discussions to cover safe work distance from the outriggers; verbal warnings; and spotters to observe the outrigger movement.

5. Operators shall ensure that the crane setup area and outriggers are not located directly over embedded tanks, trenches, cableways, pipelines, basements etc.

6. All foundations and surroundings shall be observed for changes and/or acceptability prior to lifting.

7. Bearing mats and blocking materials that satisfy the crane manufacturer’s recommendations shall be provided with each mobile crane.

8. Assembly/disassembly of a mobile crane must be directed by a qualified person, such as an experienced crane operator.

9. An experienced crane operator must perform a functional test and complete post-assembly inspection after assembly of a mobile crane before it is put back into service.
Power Line Safety

For operations near overhead power lines, a mobile crane operator must comply with these rules. This section does not apply to transmission and distribution crane operations.

1. Define the work zone.
2. Make a power line hazard assessment.
3. If any part of crane can get closer than trigger distance (20 ft for lines under 350 kv; 50 ft for lines over 350 kv) take additional steps. Select Option 1, 2, or 3:
   a. Option 1: Have the lines de-energized and visibly grounded at the worksite.
   b. Option 2: Maintain minimum clearance distance of 20/50 feet AND implement the “encroachment prevention measures”.
   c. Option 3: Maintain distances in Table A below. Determine the line’s voltage by asking the utility AND implement the “encroachment prevention measures.”
4. If Options 2 or 3 are selected, implement these “encroachment prevention measures”:
   a. Conduct a planning meeting with the operator and other workers who will be in the area.
   b. If used, tag lines must be non-conductive.
   c. Erect elevated warning lines, barricades or line of signs.
   d. In addition to the 3 measures above, also select one of these measures:
      i. Use a proximity alarm
      ii. Use dedicated spotter (must be a qualified signal person).
      iii. Use a device that automatically warns the operator to stop (range control warning device)
iv. Use device that limits range of movement.

v. Use an insulating link/device between the end of the load line and the load.

Table A – Required Clearances For Operations Near Overhead Power Lines

<table>
<thead>
<tr>
<th>Nominal Voltage, kV Phase-to-Phase</th>
<th>Minimum Required Clearance (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 50</td>
<td>10</td>
</tr>
<tr>
<td>Over 50 to 200</td>
<td>15</td>
</tr>
<tr>
<td>Over 200 to 350</td>
<td>20</td>
</tr>
<tr>
<td>Over 350 to 500</td>
<td>25</td>
</tr>
<tr>
<td>Over 500 to 750</td>
<td>35</td>
</tr>
</tbody>
</table>

NOTE: Minimum required clearance is 10’ + .4” for each 1kV greater than 50kV

Cranes Traveling under Power Lines

Cranes traveling under a power line with no load must comply with these rules. This does not apply to T&D crane operators.

1. The boom/mast and boom/mast support system must be lowered sufficiently to meet the requirements below.

2. The clearances specified in Table B below must be maintained.

3. The effects of speed and terrain on crane movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table B to be breached.

4. Dedicated spotter. If any part of the equipment while traveling will get closer than 20 feet of the power line, the employer shall ensure that a dedicated spotter who is in continuous contact with the operator is used. The dedicated spotter shall:
a. Be positioned to effectively gauge the clearance distance.

b. Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.

c. Give timely information to the operator so that the required clearance distance can be maintained.

d. Be a qualified signal person, completing signal person training and written and practical test.

5. When traveling at night, or in conditions of poor visibility, the operator shall ensure that:

a. The power lines are illuminated or another means of identifying the location of the lines shall be used.

b. A safe path of travel is identified and used.

### Table B – Minimum Clearance Distances While Traveling

<table>
<thead>
<tr>
<th>Nominal Voltage, kV</th>
<th>While Traveling Minimum Clearance Distance (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 0.75</td>
<td>4 (while traveling/boom lowered)</td>
</tr>
<tr>
<td>Over .75 to 50</td>
<td>6 (while traveling/boom lowered)</td>
</tr>
<tr>
<td>Over 50 to 345</td>
<td>10 (while traveling/boom lowered)</td>
</tr>
<tr>
<td>Over 345 to 750</td>
<td>16 (while traveling/boom lowered)</td>
</tr>
<tr>
<td>Over 750 to 1,000</td>
<td>20 (while traveling/boom lowered)</td>
</tr>
</tbody>
</table>

### Inclement Weather Mobile Crane Operation

1. When a local storm warning has been issued, a competent person must determine if it is necessary to implement manufacturer recommendations for securing the equipment.

2. For adverse weather conditions, observe operating wind velocity limits of the equipment based on manufacturer’s recommendations that consider wind loads on the surface area of the crane and the lifted load.
3. When inclement weather is imminent or anticipated, develop a lift plan and operating procedures that includes termination of lifting activities at specified conditions, anchoring procedures, the lowering and tying down of boom using cribbing, and the requirements for attaching load line to suitable anchors.

4. Discontinue operations when lightning is present and when visibility is insufficient.

Mobile Crane Operations on Barges.

When operating a crane on a barge, develop a lift plan and comply with the requirements of OSHA 1926.1437 and ASME B30.8.

Planned Engineered Lifts

1. For overhead bridge and gantry cranes only, lifts in excess of the rated load must be conducted in compliance with ASME B30.2, Section 2-3.2.1.1.

2. These lifts are limited to cranes with load rating of 5 tons and above. Load shall not exceed 125% of rated capacity. Frequency shall not exceed 2 in a continuous 12 month period.

3. Crane manufacturer shall be consulted if the planned engineered lift exceeds 125% of rated load or if frequency exceeds 2 during a continuous 12 month period.

4. Documented lift plan approved by an engineer is required.

5. For mobile cranes:
   a. The equipment must not be operated in excess of its rated capacity.
   b. Weight of load must be determined OR
   c. Operator must begin hoisting the load to determine, using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity indicator if it exceeds 75 percent
of the maximum rated capacity at the longest radius that will be used. If it does, the operator must not proceed with the lift until he verifies weight of the load.

Capacity of Slings and Shackles

1. Do not use any sling or shackle in excess of its rated capacity.
2. Do not use any sling unless it is marked with a tag which identifies size and rated capacity for types of hitches (vertical, basket, choker).
3. Do not use a wire rope sling unless it is marked with a tag which identifies the sling size, rated capacity for types of hitches, the angle upon which capacity is based, and the number of legs if more than one. Remove unmarked wire rope slings from service until the capacity can be determined by the manufacturer, a vendor, or a Duke Energy rigger and a new tag is applied.

References:
OSHA 29 CFR 1910.179, 184, 269, 333, 251, and 550 to 554
ASME B30.x series
Federal OSHA 1926, Subpart CC
Electrical Safety for Generating and Commercial Facilities

General

1. Only qualified persons shall be allowed to work near exposed, energized electrical equipment.

2. De-energize equipment or circuits before working on or near them, unless:
   a. De-energizing increases hazards.
   b. De-energizing is infeasible because of equipment design or operational limitations.
   c. Energized equipment/circuits operate at < 50 volts-to-ground and exposure to electrical burns or explosion caused by electrical arcs is not increased.

3. Unqualified persons shall not open enclosures or panels that contain exposed energized electrical parts or equipment.

4. When doing electrical work, alert others of potential hazards.

5. Pre-job briefings are required for all electrical work. Discuss hazards, work procedures, special precautions, protective equipment, energy source controls, and switching procedures.

6. If conditions change that could affect safety, hold additional job briefings with everyone involved. If personnel changes are made during a job, conduct additional pre-job briefings.

Minimum Approach Distances

1. Qualified persons shall not approach or take any conductive object without an insulating handle closer to exposed energized parts than the minimum approach distances shown in the tables below unless the:
Safe Work Practices

a. Worker is insulated from the energized part with rubber gloves and/or sleeves; OR

b. Energized part is insulated from the worker with line hose/blanket/etc.

Minimum Approach Distances for Commercial and Industrial Facilities

<table>
<thead>
<tr>
<th>Voltage Phase-to-Phase</th>
<th>Minimum Approach Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 V and less</td>
<td>Avoid contact</td>
</tr>
<tr>
<td>Over 300V, not over 750V</td>
<td>1 ft. 0 in</td>
</tr>
<tr>
<td>Over 750V, not over 2kV</td>
<td>1 ft. 6 in.</td>
</tr>
<tr>
<td>Over 2kV, not over 15kV</td>
<td>2 ft. 0 in.</td>
</tr>
<tr>
<td>Over 15kV, not over 37kV</td>
<td>3 ft. 0 in.</td>
</tr>
<tr>
<td>Over 37kV, not over 87.5kV</td>
<td>3 ft. 6 in.</td>
</tr>
<tr>
<td>Over 87.5kV, not over 121kV</td>
<td>4 ft. 0 in.</td>
</tr>
<tr>
<td>Over 121kV, not over 140kV</td>
<td>4 ft. 6 in.</td>
</tr>
</tbody>
</table>

Minimum Approach Distances for Transmission, Distribution and Generation

<table>
<thead>
<tr>
<th>Voltage Phase-to-Phase in kilovolts</th>
<th>Minimum Approach Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05 to 1.0</td>
<td>Avoid Contact</td>
</tr>
<tr>
<td>1.1 to 15.0</td>
<td>2 ft. 1 in.</td>
</tr>
<tr>
<td>15.1 to 36.0</td>
<td>2 ft. 4 in.</td>
</tr>
<tr>
<td>36.1 to 46.0</td>
<td>2 ft. 7 in.</td>
</tr>
<tr>
<td>46.1 to 72.5</td>
<td>3 ft. 0 in.</td>
</tr>
<tr>
<td>72.6 to 121</td>
<td>3 ft. 2 in.</td>
</tr>
<tr>
<td>138 to 145</td>
<td>3 ft. 7 in.</td>
</tr>
<tr>
<td>161 to 169</td>
<td>4 ft. 0 in.</td>
</tr>
</tbody>
</table>
2. All unqualified persons shall maintain these distances from overhead power lines:
   a. For lines under 50 KV -- 10 ft.
   b. For lines over 50 KV -- 10 ft. plus 4 in. for every 10 KV over 50 KV

<table>
<thead>
<tr>
<th>Voltage Phase-to-Phase in kilovolts</th>
<th>Minimum Approach Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 to 242</td>
<td>5 ft. 3 in.</td>
</tr>
<tr>
<td>345 to 362</td>
<td>8 ft. 6 in.</td>
</tr>
<tr>
<td>500 to 550</td>
<td>11 ft. 3 in.</td>
</tr>
<tr>
<td>765 to 800</td>
<td>14 ft. 11 in.</td>
</tr>
</tbody>
</table>
## Personal Protective Equipment

This table describes personal protective equipment for electrical work.

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>Work on exposed energized parts.</th>
<th>Voltage Testing</th>
<th>Motor Control Centers, Switchgear, and other Equipment</th>
</tr>
</thead>
</table>
| 50 to 200 volts | • Hard hat and safety glasses.  
• Natural fiber clothing.  
• Rubber gloves w/ leather protectors. | • Hard hat and safety glasses.  
• Natural fiber clothing.  
• See Note 1 on rubber gloves. | NA |
| 201 to 400 volts | • Hard hat and safety glasses.  
• Natural fiber clothing.  
• Rubber gloves w/ leather protectors. | • Hard hat and safety glasses.  
• Natural fiber clothing.  
• See Note 1 on rubber gloves. | See “Apparel and Arc Flash Protection.” |
| 401 to 600 volts | • Hard hat and safety glasses.  
• FR garment.  
• Clear polycarbonate face shield.  
• Rubber gloves w/ leather protectors. | • Hard hat and safety glasses.  
• FR garment.  
• Clear polycarbonate face shield.  
• See Note 1 on rubber gloves. | See “Apparel and Arc Flash Protection.” |
| Over 600 volts | PPE same as 401 to 600 volts.  
Additional requirement: Work in pairs.  
(Work alone is allowed for routine switching, work with live line tools, and emergency repairs necessary to safeguard the general public.) | PPE same as 401 to 600 volts.  
Additional requirement: Work in pairs.  
(Work alone is allowed for routine switching, work with live line tools, and emergency repairs necessary to safeguard the general public.) | See “Apparel and Arc Flash Protection.” |
Note: When performing voltage testing, workers shall assess the hazards and wear rubber gloves with leather protectors if there is a hazard of contact with other exposed energized parts.

Electrical Protective Equipment

1. The maximum-use voltage for electrical protective equipment (e.g., rubber gloves, rubber sleeves, rubber blankets, matting, and line hose) is as follows:
   a. Class 0 - 1000 volts
   b. Class 1 - 7,500 volts
   c. Class 2 - 17,000 volts
   d. Class 3 - 26,500 volts
   e. Class 4 - 36,000 volts

2. Electrical protective equipment shall be tested before first issue and re-tested as required by OSHA. Equipment tested at Toddville Glove Lab will be tested on these frequencies:
   a. Rubber gloves 4 months
   b. Rubber sleeves 4 months
   c. Rubber blankets 12 months
   d. Line hose 12 months

3. Visually inspect and air-test rubber gloves before use.

4. Visually check rubber blankets and sleeves for flaws before use.

5. Always wear leather protectors over rubber gloves. Do not use protectors for any other purpose. Exception: Class 0 rubber gloves can be used without protectors under limited use conditions where small equipment and parts manipulation necessitate unusually high finger dexterity. Take extra care in the visual examination of each glove and in avoiding handling sharp objects. Visually inspect and air test gloves before and after use.
6. When protective equipment selection depends on voltage levels, use the phase-to-phase voltage on multiphase circuits. Phase-to-ground voltage can be used if there is no multiphase exposure or if energized conductors have been covered with rubber protective equipment eliminating any possible multiphase exposure.

Apparel & Arc Flash Protection

1. As shown in the Personal Protective Equipment table, wear flame resistant clothing when working on exposed, energized electrical equipment greater than 400 volts nominal.
2. Shirts and pants worn underneath FR clothing shall be natural fiber.
3. Keep FR clothing in good condition with no rips or tears.

Jewelry

1. Do not wear jewelry (such as rings, earrings, bracelets, necklaces or pendants) where contact with energized electric lines or equipment is possible.
2. Take extra caution if wearing keys, wire rim glasses, identification badges, metal belt buckles, or metal buttons on garments.

Insulated Tools

1. If hand tools are used near exposed, energized conductors or parts AND the hand tools could make contact with the conductors or parts, the hand tools shall be the insulated type.
2. Before using insulated tools, visually inspect them to ensure the insulating material is not damaged.
3. Use insulated tools only for their designated purposes. Do not use
insulated hand tools on circuits over 1000V.

4. Insulated tools shall be marked with double triangles by the manufacturer to indicate they were manufactured and tested in compliance with ASTM F1505, Standard Specification for Insulating and Insulated Hand Tools.

5. Wear rubber gloves with insulated hand tools if the work could cause the minimum approach distance to be violated.

**Testing for Voltage**

1. Consider lines and equipment as energized until they have been isolated, tested for voltage, and grounded where applicable.

2. Wear personal protective equipment as shown in the Personal Protective Equipment table.

3. When checking for the presence of voltage, do not use tape or insulation penetrating methods.

4. When work requires direct contact with electrical circuits, use voltage testing devices to verify that the equipment is de-energized.

5. Be aware that equipment can be fed by more than one source or can be actuated from more than one location.

6. If any unusual condition is encountered (e.g., voltage present when it should not be) immediately stop work, place the equipment in a safe condition, and contact your supervisor.

7. Test for voltage initially, at shift change, and after other work stoppage.

8. If the circuit to be tested is over 600 volts, check the test equipment for proper operation immediately before and immediately after use. Follow the manufacturer’s instructions for the device.

9. If there is a possibility of the re-accumulation of stored energy to a hazardous level, verify safe work conditions periodically throughout the shift until work is completed or until the possibility of such
accumulation no longer exists.

10. Before use, visually inspect test instruments, leads, cables, power cords, probes, and connectors for external damage. If there is any doubt as to the equipment’s integrity, do not use it.

11. Verify that voltage testing devices are operating properly, and that appropriate settings are used for the parameter and type of voltage to be checked.

12. Verify that the testing device is being used for the correct application and in the proper configuration. Follow the instructions in the Operator’s Manual for the specific make and model being used.

13. Do not exceed the maximum safe voltage for the test equipment. Follow manufacturer’s guidelines and/or group procedures for specific limitations of equipment used.

Grounding

1. When grounding lines and equipment for the protection of employees, ensure safety ground leads are not less than No. 2 AWG flexible stranded copper rubber-covered cable or its equivalent and capable of conducting the maximum fault current potential and duration necessary to clear the fault. Where generation equipment has been de-energized according to lockout/tagout procedures, grounds do not have to be sized for maximum fault current.

2. When installing and removing grounds, wear rubber gloves with leather protectors, safety glasses, hard hats, and flame-resistant clothing.

3. Inspect grounding cables and connecting clamps before installation to ensure that all connections are solid and wires or connectors are not frayed or corroded.

4. Before any ground is installed, lines and equipment shall be tested and found absent of nominal voltage, unless a previously installed ground is present.
5. When a ground is to be attached to a line or to equipment, the ground-end connection shall be attached first, and then the other end shall be attached.

6. When a ground is to be removed, the grounding device shall be removed from the line or equipment before the ground-end connection is removed.

7. In switchyards and on Power Delivery installations, grounds shall be attached to and removed from the line or equipment with a live line tool.

**Tools, Equipment, & Fixtures**

1. When working near energized circuits, use only flashlights with exposed parts made of nonconductive material.

2. When working on or near electrical equipment, use ladders with nonconductive siderails.

3. If portable electric space heaters are used, they must be attended while in use, turned off after normal working hours, and kept at least 3 feet away from combustible materials.

4. Applies to temporary lighting: Lamps used for general illumination shall be protected from accidental contact or breakage by a suitable fixture or lamp holder with a guard. Do not use brass shell, paper-lined sockets, or other metal-cased sockets unless the shell is grounded.

5. Before replacing fuses, verify that ratings and types are correct.

6. Appropriate tools shall be used for installing and removing fuses.

7. Before working on energized equipment, try to dry wet floors. If floors cannot be dried, use rubber gloves, insulating blankets, and a wooden foundation to elevate the blanket above the moisture.

8. Secure or remove doors, hinged panels, etc. to prevent them from swinging into a worker and causing contact with exposed energized
Safe Work Practices

9. For arc welding equipment, provide a disconnecting switch or controller at or near each welding machine which is not equipped with such a switch or controller mounted as an integral part of the machine. In Fossil Hydro Carolinas, follow department specific procedures for connecting to welding receptacles.

10. When working on rackable motor control centers, either remove or secure the cubicle to prevent re-engagement to the bus.

Extension Cords

1. Before using extension cords, inspect them for loose parts, damaged pins and defective insulation. Replace damaged cords.

2. Only use extension cords with grounding conductors.

3. Do not raise and lower equipment with extension cords connected to the equipment.

4. Do not fasten extension cords with staples or hang them in a fashion that could damage the outer jacket, insulation, or conductors.

5. Elevate extension cords passing through work areas to protect them from damage and to eliminate tripping hazards.

6. Be sure your hands are dry when plugging or unplugging extension cords.

7. Properly secure locking connectors after connection, if applicable.

8. If an extension cord is wet from immersion, wear rubber gloves if it is still energized.

9. Protect extension cords from vehicular traffic (e.g., forklifts, manlifts, tractors).

Electrical Equipment in Conductive Work Locations.

1. Portable electric equipment used in highly conductive work locations (such as those inundated with water or other conductive liquids) or in
job locations where workers are likely to contact water or conductive liquids shall be approved for those locations.

2. In job locations where workers are likely to contact or be drenched with water or conductive liquids, ground-fault circuit-interrupter protection for personnel shall also be used.

**Batteries**

1. Do not smoke or create sparks, arcs, or flames in battery areas. Post signs accordingly.

2. Take extreme caution when carrying or using conductive materials around batteries. Use insulated hand tools.

3. To prevent shocks, avoid physical contact with exposed conductors on batteries.

4. Do not remove vent plugs from cells, unless specific maintenance work is being performed. Immediately reinstall vent plugs after work is completed.

5. Before performing battery-related tasks, check the location of the nearest eyewash or eyewash/shower. If the eyewash/shower has not been tested within the last week, test it before working on the batteries.

6. Battery-related tasks may be performed by persons working alone. Ask for assistance if necessary.

7. Provide adequate ventilation in battery rooms.

8. When charging, repairing, or servicing batteries, follow manufacturer’s recommendations.

9. Wear personal protective equipment as follows:
   a. Eye protection, full-face shield, chemical resistant gloves, full-body apron, and protective footwear to:
      i. Add/remove electrolytes (acid)
Safe Work Practices

ii. Move lead acid cells
iii. Check specific gravity
iv. Wash/clean battery cells

b. Eye protection to:
   i. Read cell battery voltage
   ii. Adjust intercell connecting hardware

Switchyard

1. Consider all conductors and equipment as energized until tested for voltage and grounded.

2. Report any unusual conditions observed on substation structures, equipment, ground wires, busses, or wiring to supervision or the system coordinator.

3. When entering an occupied substation, report your presence to the employee in charge.

4. In substation job briefings, discuss the location of energized equipment in or adjacent to the work area.

5. Lock substation entrances that are not observed by an attendant.

6. Post DANGER KEEP OUT signs (or the equivalent) to warn unauthorized persons.

7. Provide guarding around live parts over 150 volts-to-ground that do not have an insulating cover unless they are located to prevent inadvertent contact.

8. Unless it is an emergency, obtain permission from the system coordinator or other authorized persons before energizing or de-energizing a substation, the equipment in the substation, and the associated lines or busses.

9. Ensure switching operations are performed only by qualified persons.

10. For all live-line tools:
Safe Work Practices

a. Wipe clean and inspect daily before use. Properly wax as needed.

b. Every 2 years, dielectrically test at 75,000 volts per foot for one minute. Use appropriate tester.

c. Do not place on the ground.

d. When refinished, repaired, or failing a visual inspection, dielectrically test before returning to service.

11. Use red tape to designate energized areas next to work areas.

12. Attach red tape or red flags to designate safe heights on structures, columns, or poles above which workers may not climb because of energized equipment or circuits.

13. Carry or place conductive material so as to prevent contact with energized lines, equipment, or busses.

14. Do not use metallic cloth tapes, metal tapes, metal rules, or other conductive material near energized conductors or equipment.

15. Before applying grounds, de-energize static capacitors for 5 minutes.

16. Attach fall protection only to designated substantial anchorage points; do not attach to conductors or cables.

17. Do not use portable metal or other conductive ladders in substations.

Ground Fault Protection for Personnel in Construction

(Ground Fault Protection for Personnel in Maintenance is covered in the EHS Manual, Electrical Safety in Generating and Commercial Facilities Program)

1. Persons must be protected from ground fault hazards as described below during activities involving construction, remodeling, maintenance, repair, or demolition of buildings, structures, equipment, or similar activities.

2. Temporary Wiring: Use Ground Fault Circuit Interrupter (GFCI) on all 120 volts, single-phase 15, 20, and 30 amp receptacles that are not part of the permanent wiring of a building or structure.
3. Portable generators: Follow National Electric Code requirements. GFCI is not required on receptacles on 2-wire, single-phase portable or vehicle mounted generators rated not more than 5 KW where the circuit conductors of the generators are insulated from the generator frame and all other grounded surfaces. For all other conditions, GFCI is required.

4. For cord sets, extension cords, and cord- and plug-connected tools, comply with one of the following options:
   a. Option 1: Use GFCI on all cord sets, extension cords, and cord- and plug-connected tools. When using portable GFCIs, install the GFCI between the receptacle and the cord set, not between the tool and the cord set.
   b. Option 2: Implement an assured equipment grounding program.
      i. Visually inspect cord sets, extension cords, and tools before each day’s use for external defects.
      ii. Test extension cords and grounded tools for continuity before first use, quarterly, and following repairs. Testing is not required for double-insulated tools or for cords with illuminated ground continuity monitors.

References:
OSHA 1910.269
OSHA 1910.137
OSHA 1910.331-335
OSHA 1910.301-308
NFPA 70E, Electrical Safety Related Work Practices
ASTM 1505, Specifications for Insulating and Insulated Hand Tools
Unique California requirements at http://www.dir.ca.gov/Title8/sub5.html
Determining Existing Conditions

1. Prior to working on electrical lines and equipment, employees shall determine existing conditions including:
   a. Nominal voltages of lines and equipment
   b. Switching transient voltages
   c. Induced voltages
   d. Integrity of grounds
   e. Condition of poles
   f. Environmental conditions relative to safety (e.g., high winds, ice)
   g. Locations of circuits and equipment including power and communication lines
   h. Fault current availability
   i. Presence of co-generation or home generators

Medical Services and First Aid

1. For transmission and distribution work, when 2 or more employees are working on exposed, energized equipment, at least 2 persons trained in first aid/CPR shall be present.

2. First aid kits in weatherproof containers shall be readily accessible at all T&D work locations. For line crews, first aid kits shall be inspected at least annually. At construction sites, first aid kits shall be inspected weekly.

3. When the eyes or body parts may be exposed to corrosive materials or chemicals, emergency eyewash facilities shall be available.
Job Briefing

1. Job briefings are required to be performed at the start or resumption of each work activity.

2. The supervisor, crew leader, or employee-in-charge along with crew members will hold a job briefing to review work procedures, hazards associated with the job, special precautions, energy source controls, and personal protective equipment.

3. It is the responsibility of the person in charge to conduct these briefings:
   a. At the beginning of work shifts.
   b. At the start of the job.
   c. After a job has been interrupted for any reason.
   d. When personnel are added to or removed from the job.
   e. When any conditions change that could affect employee safety.

4. A brief discussion is sufficient if the work is routine and the employees, through training and experience, can reasonably be expected to recognize and avoid the hazards involved in the job.

5. A more detailed briefing is required however, if the work is complicated or especially hazardous.

6. When employees are working alone, they should plan the work as if a job briefing were held.

7. The job briefing shall include these topics:
   a. Safety assessment
   b. Work area protection set up
   c. Individual responsibilities
   d. Positioning of vehicles
   e. Underground utility locates
   f. Cover-up
g. Check all PPE and fall arrest devices
h. Nominal voltage of circuit and identification of switches/protective devices if needed
i. Work procedures
j. Hazards associated with the job
k. What could go wrong
l. Preventive measures, special precautions
m. What to do if something goes wrong
n. Protective devices

**Personal and Electrical Protective Equipment**

1. All personal protective equipment shall be properly worn per manufacturer’s instructions.

2. Wear hard hats and safety glasses on job sites.

3. Before each day’s use, inspect electrical protective equipment for visible defects.

4. Air test rubber gloves before use daily.

5. Electrical protective equipment used by Duke Energy employees shall be tested as shown. Do not use equipment if the test date is exceeded.

<table>
<thead>
<tr>
<th></th>
<th>Test frequency minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber gloves</td>
<td>4 months</td>
</tr>
<tr>
<td>Rubber sleeves</td>
<td>4 months</td>
</tr>
<tr>
<td>Blankets</td>
<td>12 months</td>
</tr>
<tr>
<td>Line hose</td>
<td>12 months</td>
</tr>
</tbody>
</table>

6. If a defect is found during inspection of personal protective equipment, electrical protective equipment or live line tools, the
equipment must be marked defective and not used. Return rubber goods for retest if they are suspected to be defective.

7. Wear leather glove protectors over rubber gloves at all times. Do not use leather glove protectors for any other purpose.

8. Wear rubber gloves and sleeves in work situations as described in detail in the Work Standards Manual, Section 3.3.

9. Dielectric footwear shall be worn while at or below ground level whenever danger from step or touch potential exists. Dielectric footwear shall be worn:
   a. While handling downed conductors when working on the ground.
   b. While on the ground and the line is grounded with personal protection grounds.
   c. While switching primary underground systems, either by hand or with a hotstick.
   d. While operating gang switches, disconnects, air break handles, or any device energized over 600V while on the ground.
   e. While opening or closing padmount transformers and equipment.
   f. While installing or removing fuses in cutouts from the ground with a telescopic hotstick or operating pole.
   g. While working around temporary mobile equipment in a substation.
   h. While scouting, troubleshooting, or walking lines during outage restoration.
   i. While on the ground when overhead energized work is being performed and the truck is grounded.

10. Dielectric footwear must comply with ASTM F1117. Shoes that are designated “EH Hazard” do not qualify as dielectric footwear.
11. A class II, 20KV or greater rubber blanket placed on the ground can be used as a substitute for dielectric shoes. Dielectric footwear is not required in substations where adequate gravel and ground grids are present.

12. Visually inspect dielectric shoes daily and replace if worn or defective.

13. Work shoes should have substantial uppers made of leather or the equivalent, covers the entire foot with no openings, provides ankle support, and has slip resistant soles. Office environment footwear should minimize the potential for slipping or tripping.

Fall Protection

1. Before climbing a wood pole, employees must determine if the pole is safe to climb. Inspect for visible defects and test the pole for decay by sounding at ground level with a hammer and by probing below ground level with a probing tool.
   
   a. If the pole is found to be unsafe to climb or to work from, it must be secured so that it does not fail while an employee is on it. The pole can be secured by a line truck boom, by ropes or guys, or by lashing a new pole alongside it. If a new one is lashed alongside the defective pole, work should be performed from the new one. Tag unsafe poles to prevent others from climbing.

2. Before climbing towers, carefully examine to ensure they are safe and inspect base for corrosion or structural defects.

3. Employees shall use fall protection (harness and lanyard connected to lifeline or anchorage point) at all times when working at elevated locations and when ascending, descending or changing locations on steel towers, steel poles, concrete poles and substation structures.

4. Use full body harness with shock absorbing lanyard when working out of a bucket truck, on an aerial platform, or on top of transformers or other equipment. Right-of-way workers may use a body belt with lanyard when working in a bucket.
5. Employees climbing distribution and transmission class wood poles shall use fall protection equipment while ascending, descending and changing locations on a pole. This shall consist of a BuckSqueeze or similar equipment. Work positioning equipment alone is not allowed.

Live Line Tools

1. Visually inspect live line tools and wipe them clean before use each day. If a defect or contamination could adversely affect the insulating quality or the mechanical integrity of the tool, remove it from service and have it tested before returning to service.

2. Every 2 years, every live-line tool shall be examined, cleaned, repaired if necessary, and electrically tested.

Materials Handling and Storage

1. In areas not restricted to qualified employees, do not store materials closer to energized lines or exposed energized parts than 10 feet for lines 50 KV and less.
   a. For lines over 50 KV, the distance is 10 ft plus 4 inches for every 10 KV over 50 KV.

Working On or Near Exposed Energized Parts

General

1. Consider electric lines and equipment energized unless they have been properly isolated, tested for voltage, and grounded.

2. Only qualified employees shall work on or with exposed energized lines or parts and in areas containing unguarded, uninsulated energized lines or parts of equipment at 50 V or more.

3. When working around exposed energized parts, employees shall use proper protective equipment and work practices and comply with minimum approach distances.

4. Avoid positions where a shock or slip could expose the body to
equipment at a potential different from the body.

5. When installing or removing fuses with one or both terminals energized at more than 300 V or with exposed parts over 50 V, use the appropriate tools or gloves. When installing expulsion-type fuses with one or both terminals energized over 300 V, wear safety glasses or goggles, stay clear of the fuse barrel exhaust path, and use tools rated for the voltage.

6. Ensure devices used to open circuits under load are designed to interrupt the current involved.

7. At least two employees shall be present for this work:
   a. Installation, removal, or repair of lines over 600 V.
   b. Installation, removal, or repair of de-energized lines if an employee is exposed to contact with other parts over 600 V.
   c. Installation, removal, or repair of transformers, capacitors, and regulators if the employee is exposed to parts over 600 V.
   d. Work involving the use of mechanical equipment, other than insulated aerial lifts, near parts over 600 V.

8. Employees may work alone for:
   a. Work involving equipment energized at 600 V or less.
   b. Routine switching of circuits, if conditions at the site allow the work to be done safely.
   c. Work done with live-line tools if the employee is not within reach or otherwise exposed to contact with energized parts.
   d. Emergency repairs (e.g., power restoration) to the extent necessary to safeguard the general public.
   e. Substation work not involving direct contact with live parts or climbing on structures.
   f. Opening disconnects with live-line tools.
Making Connections

1. If connecting de-energized equipment or lines to an energized circuit using a conducting wire or device, attach the wire to the de-energized part first.

2. If disconnecting, remove the source end first, and keep loose conductors away from exposed energized parts.

3. When lines or equipment are connected to or disconnected from energized circuits, keep loose conductors away from exposed energized parts.

Minimum Approach Distances

1. Employees shall not approach or take any conductive object closer to exposed energized parts than the minimum distance shown in AC Minimum Approach Distance from Live Parts table unless the employee is:
   a. Insulated from the energized part by wearing rubber gloves and/or sleeves that are rated for the voltage. OR
   b. The energized part is insulated with line hose or rubber blankets. OR
   c. Doing live-line bare-hand work.

AC Minimum Approach Distance from Live Parts

<table>
<thead>
<tr>
<th>Nominal voltage in KV phase-to-phase</th>
<th>Distance phase-to-employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05 to 1.0</td>
<td>Avoid contact</td>
</tr>
<tr>
<td>1.1 to 15.0</td>
<td>2 ft. 1 in.</td>
</tr>
<tr>
<td>15.1 to 36</td>
<td>2 ft. 4 in.</td>
</tr>
<tr>
<td>36.1 to 46</td>
<td>2 ft. 7 in.</td>
</tr>
<tr>
<td>46.1 to 72.5</td>
<td>3 ft.</td>
</tr>
</tbody>
</table>
### Nominal voltage in KV phase-to-phase

<table>
<thead>
<tr>
<th>Nominal voltage in KV phase-to-phase</th>
<th>Distance phase-to-employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>72.6 to 121</td>
<td>3 ft. 2 in.</td>
</tr>
<tr>
<td>138 to 145</td>
<td>3 ft. 7 in.</td>
</tr>
<tr>
<td>161 to 169</td>
<td>4 ft.</td>
</tr>
<tr>
<td>230 to 242</td>
<td>5 ft. 3 in.</td>
</tr>
<tr>
<td>345 to 362</td>
<td>8 ft. 6 in.</td>
</tr>
<tr>
<td>500 to 550</td>
<td>11 ft. 3 in.</td>
</tr>
<tr>
<td>765 to 800</td>
<td>14 ft. 11 in.</td>
</tr>
</tbody>
</table>

### Protective Cover-Up

1. When working on or near energized or de-energized conductors, neutrals or equipment, cover conductors or equipment you may contact. See the Work Standards Manual for examples of proper work methods for using protective insulating equipment.

2. Inspect protective cover-up equipment visually before using to ensure they are in good condition and suitable for the purpose and within test dates.

3. Remove defective equipment from service and mark as defective.

### Apparel & Jewelry

1. All employees working within 10 feet of exposed, energized conductors or equipment shall wear flame resistant clothing. Shirts and pants worn underneath shall be 100% natural fiber. Protective arc rating shall be at least 4.2 cal/cm².

2. Over 300 volts, shirts must be long sleeved.

3. See the Work Standards manual for arc flash requirements on transmission systems.

4. When employees are subject to perform pole top rescue, or manhole
rescue; appropriate flame resistant clothing is required to be worn.

5. When worn within 10 feet of exposed, energized conductors, rain coats, jackets, pants and hoods shall meet ASTM Standard F1891-02a for arc resistant rainwear.

6. No jewelry or conductive articles shall be worn by employees while performing physical work, other than in an office type environment or while driving. This typically includes loading and unloading material and any work at a job site or substation. This includes but is not limited to: metal or plastic watches, rings, metal or plastic bracelets, metal studs, earrings and necklaces.

7. Eye glasses, and medic alert necklaces and bracelets are not considered jewelry and are exempt from this jewelry exclusion. However medic alert necklaces and bracelets shall be worn under FR clothing or rubber protective gloves if working on energized conductors.

**De-Energizing Lines and Equipment for Employee Protection**

1. Before considering lines and equipment to be worked on as de-energized, ensure they are de-energized as described below, tested for voltage, and grounded.

2. For systems under the control of a dispatcher or operator, obtain a clearance to de-energize the lines according to standard operating procedures.

3. De-energize lines and equipment by opening the proper switching device such as disconnects, interrupters, circuit breakers, reclosers, line switches, or fuses.

4. For systems not under the control of a dispatcher or operator, isolate lines by doing one or more of the following:
   a. Removing fuses
   b. Disconnecting recloser leads
c. Opening switches

d. Removing jumpers

5. Render inoperable as design permits and tag the following:
   a. Automatically and remotely controlled switches that could cause the opened disconnection means to close (tag at the point of control)
   b. All switches, disconnects, jumpers, taps, and other means through which electricity may be supplied to the lines and equipment.

6. Tags used shall prohibit operation of the disconnecting means and indicate that employees are at work. If an employee (or one crew) is working alone and the means of disconnection are accessible and visible, tags are not required.

7. If design permits, render the recloser inoperable and tag it; remove source or load side leads of the recloser or open source or load side disconnects of the recloser for a visual open point. For parking the leads, use stand-off tool.

8. Render inoperable any disconnecting means that are open to protect employees and that are accessible to the public.

9. Test to verify that the lines and equipment are de-energized.

10. Install grounds as outlined in “Grounding” in this document.

11. To release a clearance, the employee in charge shall:
   a. Notify the crew.
   b. Determine that everyone is clear of the lines and equipment.
   c. Remove all protective grounds.
   d. Report this information to the system operator and release the clearance.

12. Do not re-energize lines until: all grounds have been removed; all crews have released their clearances; all employees are clear of the
lines and equipment; and all tags have been removed.

Grounding for the Protection of Employees

1. Before considering lines and equipment to be worked on as de-energized, ensure they are de-energized as described above, tested for voltage, and grounded as described here.

2. If installing a ground is impractical or would create greater hazards, treat the lines and equipment as de-energized if all the following conditions are met:
   a. The lines and equipment are de-energized as required.
   b. Contact with another energized source is not possible.
   c. No hazard of induced voltage exists.

3. Before installing grounds on a supposedly de-energized circuit, visually inspect the grounding equipment.

4. To verify that the circuit has been de-energized, use an approved voltage testing device to check for voltage on the conductors to be grounded.

5. Place temporary protective grounds at such locations and arrange in such a manner as to prevent each employee from being exposed to hazardous differences in electrical potential.

6. Ensure protective grounding equipment:
   a. Is capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault.
   b. Has an ampacity greater than or equal to that of #2 AWG copper (Duke Energy requires 2/0 in most applications).
   c. Has an impedance-to-ground low enough to cause immediate operation of protective devices in case of accidental energizing of the lines or equipment.
7. If there is no previously installed ground, test lines and equipment before installing any ground to ensure they are free of nominal voltage.

8. If attaching grounds to lines or equipment, attach the ground-end connection first; then attach the other end using live-line tools.

9. When a ground is to be removed, the grounding device shall be removed from the line or equipment using a live-line tool before the ground-end connection is removed.

10. If work is performed on a cable at a location remote from the cable terminal and the hazardous transfer of potential is possible should a fault occur, do not ground the cable at the cable terminal.

11. Grounds may be removed temporarily during tests. During the test, use insulating equipment and other measures necessary to protect exposed employees in case the lines and equipment become energized.

12. When attaching grounds to and when removing grounds from de-energized lines or equipment, wear hard hat, safety glasses, rubber gloves, and flame resistant clothing.

**Mechanical Equipment**

1. Inspect the critical safety components of mechanical elevating and rotating equipment on each shift the equipment is used.

2. Do not operate vehicular equipment with an obstructed rear view on off-highway job sites that expose employees to hazards created by the moving vehicle, unless the vehicle has a reverse signal alarm audible above the surrounding noise level or it is backed up only when a designated employee signals that it is safe to do so.

3. If the suspended load of a line truck endangers any employees, do not leave the controls of the truck.

4. If vehicular equipment includes outriggers:
   a. Operate with the outriggers extended and firmly set as necessary to keep the vehicle stable.
b. Do not extend or retract outriggers outside of operator’s clear view unless all employees are outside the range of possible equipment motion.

5. Use lifting equipment within its maximum-load rating and other design limitations for the work conditions.

6. Qualified employees shall operate mechanical equipment so that minimum approach distances of Table 1 are maintained from exposed energized lines and equipment. The insulated portion of an aerial lift operated by a qualified employee is exempt from this requirement.

7. Ensure a designated employee other than the operator observes the approach distance to exposed lines and gives timely warnings before the approach distance is reached (not required if operator can safely determine distance alone).

8. If mechanical equipment could become energized when used around overhead power lines, ground the equipment as described in Work Standards Manual.

**Overhead Lines**

1. Before climbing, installing, or removing any equipment, determine the amount of additional or unbalanced stress a pole or tower can handle; if necessary, support the pole or tower with braces.

2. When poles are set, moved, or removed near overhead conductors, avoid direct contact of the pole with energized conductors.

3. When handling poles near overhead power lines, wear appropriate electrical protective equipment (rubber gloves/sleeves and dielectric footwear).

4. Install pole covers or cover conductors when setting a pole in or near conductors energized at primary voltage.

5. Do not contact the poles with uninsulated body parts.

6. Guard pole holes in areas where employees are working, or provide
7. To minimize the possibility that conductors and cables being installed or removed will contact energized lines or equipment, take precautions (e.g., using barriers or the tension-stringing method).

8. Provide the safeguards listed for mechanical equipment near energized lines (see Table 1 Minimum Approach Distances) for conductors, cables, and pulling and tensioning equipment when installing close enough to energized conductors to be energized by any of the following:
   a. Failure of the pulling or tensioning equipment
   b. Failure of the wire or cable being pulled
   c. Failure of the previously installed lines or equipment

9. If installing or removing conductors that cross over energized conductors in excess of 600 V, render inoperative the automatic reclosing feature for the energized lines if permitted by the design of the circuit-interrupting devices protecting the lines.

10. Determine the voltage to be induced in the new lines before lines are installed parallel to existing energized lines.

11. If hazardous voltage induction is possible, do the following:
   a. Ground each bare conductor so that no point is more than 2 miles from a ground.
   b. Do not remove the grounds until the conductor installation is completed between dead ends.
   c. Remove grounds as the last phase of aerial cleanup.
   d. If working on bare conductors, install grounds at:
      i. Each work location where the employees are working.
      ii. All open dead-end or catch-off points or the next adjacent structure.
      iii. If splicing two bare conductors, bond and ground the
conductors before splicing.

12. Keep reel handling equipment, including pulling and tensioning devices:
   a. In safe operating condition.
   b. Leveled.
   c. Aligned.

13. Do not exceed load ratings of stringing lines, pulling lines, conductor grips, load-bearing hardware and accessories, and rigging and hoists.

14. Repair or replace defective pulling lines and accessories.

15. Do not use conductor grips on wire rope, unless the grip is specifically designed for the application.

16. Maintain reliable communications, through 2-way radio or the equivalent, between the reel tender and the pulling-rig operator.

17. Operate the pulling rig only when it is safe to do so.

18. While the conductor or pulling line is being pulled (in motion) with a power-driven device, do not stand directly under overhead operations or on the cross arm, except as necessary to guide the stringing sock or board over or through the stringing sheaf.

**Towers and Structures**

1. Unless assisting employees working above, do not stand under a tower or structure while work is in progress.

2. Unless it is more hazardous, use tag lines or other similar devices to maintain control of tower sections being raised or positioned.

3. Do not detach the loadline from a member or section until the load is safely secured.

4. Discontinue work when adverse weather conditions make the work unusually hazardous, except during emergency power restoration procedures.
Underground Electrical Installations

1. Use protective equipment and follow work practices when working in underground electrical installations.

2. When accessing manholes and subsurface vaults:
   a. Use ladders or other climbing devices to enter and exit manholes and subsurface vaults more than 4 ft. deep.
   b. Do not step on cables or hangers to climb into or out of manholes or vaults.

3. When lowering equipment into manholes:
   a. Use equipment capable of supporting appropriate weight to lower materials and tools into manholes or vaults.
   b. Check equipment used to lower materials for defects before use.
   c. Clear the area directly under the opening before lowering hot solder or other hot compounds into the manhole or vault opening.

4. Ensure an employee trained in first aid/CPR is available on the surface to render any necessary emergency assistance while work is performed in a manhole containing energized electric equipment.

5. Allow the employee trained in first aid/CPR to briefly enter a manhole to assist if there are no atmospheric or traffic hazards.

6. If work can be performed safely in a manhole with energized cables or equipment, allow an employee working alone to enter a manhole briefly to inspect, housekeep, take readings, etc.

7. Maintain communications, through 2-way radios or the equivalent, among all employees involved in the job.

8. Install duct rods in the least hazardous direction.

9. Ensure the required clearance distances are maintained by stationing an employee at the far end of the duct line being rodded.
10. Inspect energized cables for defects.

11. When working on multiple cables:
   a. Identify the cable to be worked by electrical means, unless its identity is obvious by reasons of distinctive appearance or location, or by other readily apparent means of identification.
   b. Protect cables other than the one being worked on from damage.

12. Do not work in a manhole where energized cables appear defective (e.g., oil or compound leaking from cable joint, broken cable sheaths or joint sleeves, hot localized surface temperatures of cables or joints, swollen joints where circumference exceeds 3.5 times the sleeve diameter).

13. If the defective cable or splice cannot be de-energized because of service load conditions, enter the manhole only if protected from the possible effects of a failure by shields such as Kevlar blankets.

14. Cover all energized splices in manholes with Kevlar blankets.

15. Maintain metallic sheath continuity when work is performed on buried cable and cable in manholes or treat the cable sheath as energized.

Electric Vault and Manhole Entry

1. Employees entering electric vaults and manholes shall complete Confined Space Training and shall be trained in rescue techniques.

2. Anytime work is performed in a manhole or vault, an attendant trained in first aid/CPR shall be present outside. For brief entries to perform inspections, housekeeping, or to take readings, an attendant is not required. The attendant can enter briefly to assist in the work if air monitoring indicates no atmospheric hazard, a work zone for road and street work has been set up, and the traffic patterns do not present a hazard.
3. Conduct atmospheric testing prior to entry. Ventilate or monitor continuously during entry.

4. Rescue equipment shall be available at the job site anytime work is done in a manhole or vault. Rescue equipment is not required for brief entries for inspections, housekeeping, or taking readings.

5. Employees may not enter a manhole or vault while it contains a hazardous atmosphere unless they comply with permit-required entry requirements of the Confined Space Entry program.

Mechanized Equipment

Duke Energy business units and contractors shall ensure the integrity of mechanized equipment by having systems in place for the inspection and maintenance of this equipment. This includes equipment such as: material handling equipment, earthmoving equipment; excavating equipment; lifting equipment; powered industrial trucks; aerial devices, and elevating work platforms.

Traffic Vests

1. Wear reflective traffic vests where there is possible danger of impact from vehicular traffic. Traffic vests shall be worn at all times when working in, on, or along any roadway. This includes while working inside the work zone, on a sidewalk, or on the road shoulder.

2. Traffic vests shall be worn in heavy traffic areas such as busy parking lots.

3. Raincoats that are ANSI1007-2004 Class 2 rated can be worn without traffic vests.

4. Ensure that traffic vests are ANSI Flame Resistant rated before performing energized work.

5. Hi Vis flame resistant shirts, (such as Bulwark catalog numbers SMW2HV and SMW8HV), can be worn without traffic vests.
References:

OSHA 1910.269 and 1910.137
NESC
ANSI Z133.1. Safety Requirements for Arboricultural Operations
Elevating Work Platforms

Scope
This section outlines requirements for the operation of boom-supported elevating work platforms, self-propelled elevating work platforms, and manually propelled elevating work platforms. This includes devices known as JLGs, Genies, and scissor lifts.

General

1. The operator shall ensure the operating and maintenance manuals are stored on the platform.

2. The operator shall comply with manufacturer’s warnings and instructions.

3. Only personnel who are trained in the operation of elevating work platform shall operate, ride in, or work from the platform.

4. Personal fall arrest equipment is required for workers working from boom-supported elevating work platforms.

5. Workers working in scissor lifts shall be protected by guardrails or personal fall arrest if guardrails are not installed.

Prestart Inspection

1. Before use each day, the operator shall ensure that a prestart inspection is conducted. The prestart inspection shall include:
   a. Operating and emergency controls;
   b. Safety devices;
   c. Personal protective devices;
   d. Air, hydraulic, and fuel system leaks;
   e. Cables and wiring harness;
   f. Loose or missing parts;
Safe Work Practices

g. Tires and wheels;
h. Placards, warnings, control markings, and operating manuals;
i. Outriggers, stabilizers, extendable axles and other structures;
j. Guardrail system;

2. Any problems or malfunctions shall be repaired prior to use of the platform.

Workplace Inspection

1. Before the aerial platform is used and during use, the operator shall check the area in which the aerial platform is to be used for possible hazards including:
   a. Drop-offs or holes;
   b. Slopes;
   c. Bumps and floor obstructions;
   d. Debris;
   e. Overhead obstructions and electrical conductors;
   f. Hazardous atmospheres;
   g. Inadequate surface and support to withstand load forces imposed by the aerial platform;
   h. Wind and weather conditions;
   i. Presence of unauthorized persons;
   j. Other possible unsafe conditions.

2. Prior to each operation, the operator shall ensure:
   a. Outriggers are used as required;
   b. Guardrails are installed and access gates closed;
   c. Load and its distribution on the platform are in accordance with manufacturer’s rated capacity;
d. All personnel on the platform have PPE for the work and environment envisioned.

Driving Requirements

1. Before and during driving while the platform is elevated, the operator shall:
   a. Maintain a clear view of the support surface and route of travel;
   b. Ensure personnel in the worksite area that may be affected are aware of the movement, communicating and maneuvering the aerial platform as required to protect against personal injury;
   c. Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps and other hazards to ensure safe travel;
   d. Maintain a safe distance from overhead obstacles.
   e. Maintain the minimum approach distance from energized power lines. For operators who are not qualified T&D line technicians, the distances are:
      i. Up to 50 kv: 10 feet.
      ii. Over 50 kv: 10 feet plus 4 inches for every 10 kv over 50 kv.
Emergency Response

1. Obtain and become familiar with the facility Emergency Action Plan and participate in drills and training activities.

2. Provide safety observations or concerns to your supervisor or the local EHS Professional.

3. In the event of a chemical emergency, practice SWIM if it is safe to do so.
   - Secure the scene
   - Warn others
   - Inform the appropriate facility personnel
   - Monitor the situation until qualified emergency response personnel arrive

4. Be able to recognize the emergency evacuation signal.

5. Know and use designated evacuation routes and exits.

6. When an alarm or other notification is activated, report to your assigned assembly area, or proceed to your designated area of safe refuge, and remain there until instructed otherwise.

7. Know and understand the site process for reporting emergencies (e.g., site emergency phone numbers vs. 911)

8. Report all fires immediately, regardless of the size of the fire.

9. Follow the instructions of all emergency response personnel.

10. If you are a member of an emergency response team (HAZMAT, Fire Brigade, Confined Space Rescue, etc.):
    a. Ensure that your required training is current
    b. Follow the procedures in the facility’s Emergency Response Plan
    c. Inspect all emergency response equipment prior to use
    d. Inform the rescue team leader of any medical or other personal issues that would prevent you from safely participating in a response.
Emergency Shower & Eyewashes

1. Know the effects of chemicals with which you are working. Read, ask questions about, and understand material safety data sheets for each chemical with which you work.

2. Always wear personal protective equipment suitable for the material.

3. Learn the location and use of all emergency equipment, even if you are working in a new area for only a brief time.

4. Prior to starting work, flush eyewash/showers if they have not been flushed in the last week.

5. Know how to help others reach showers and eyewashes and how to help them get medical assistance.

6. Immediately wash off even small amounts of chemicals.

7. In case of chemical exposure, flush skin and eyes with cool water for at least 15 minutes. Do not rub.

8. Hold your eyes open with your hands while using an eyewash to be sure water reaches the eyes.

9. Remove contaminated clothing after the shower has been activated.

10. Get medical assistance immediately following flushing.

11. If possible, continue flushing while on the way to medical help.
Electromagnetic Fields (EMF) and Medical Devices

1. High electromagnetic fields (EMF) may interfere with the operation of medical devices. High EMF levels may be present in electrical equipment located in generating station switchyards, station main bus lines and other locations such as substations.
   a. Office areas do not present a risk.

2. Employees who have medical devices such as internal pacemakers, defibrillators, insulin pumps and pain modification devices are encouraged to consider voluntarily reporting such devices to supervision.
   a. Management cannot require employees to report medical devices, but employees should consider doing so.
   b. While cochlear implants and hearing aids may be affected, they should not present a life threatening risk.

3. Supervision and Human Resources will work with Corporate EHS (site EHS for nuclear) to evaluate the employee’s work areas for exposure to electromagnetic fields and potential impact to medical devices.
   a. Evaluations will be provided for Duke Energy employees only. Contractors with concerns should consult their own company safety representatives.

4. Where EMF levels exceed recommended limits, the Job Adjustment Modifications (JAWM) Program will be implemented by Human Resources.

5. Personnel with medical devices should not enter generating plant switchyards due to high electromagnetic fields.

6. Employees, contractors, and visitors should observe signs warning of EMF interference with medical devices posted at generating plant switchyards and other areas.

7. In all situations, if there appears to be an immediate hazard related to
Safe Work Practices

medical device operation and high levels of EMF
a. Stop work.
b. Move away from the high EMF source
c. Contact your supervisor.
Ergonomics

Work Practices to avoid Musculoskeletal Disorders

1. Employees should be cognizant of the primary risk factors that can lead to the development of musculoskeletal disorders:
   a. Awkward postures
   b. Excessive force
   c. Excessive repetition
   d. Contact stress (hard edge/pressure)
   e. Heavy vibration

2. Employees should recognize the signs of musculoskeletal disorders:
   a. Decreased range of motion
   b. Deformity or swelling
   c. Decreased grip strength
   d. Loss of function (e.g., cannot close hand)

3. Employees should recognize the symptoms of musculoskeletal disorders:
   a. Persistent numbness
   b. Burning sensation
   c. Pain
   d. Tingling
   e. Cramping
   f. Stiffness

4. Alternate work patterns and tasks as much as possible throughout the day to allow rest for different muscle groups.

5. Perform stretching exercises periodically throughout the workday to relieve stressed muscles.
Safe Work Practices

6. Keep your body in “neutral” positions, as much as possible.
7. Always use good posture.
8. Begin or continue a physical fitness program.
9. Report MSD signs and symptoms through normal incident reporting process.

Work Stations

1. Adjust working height of chair, desk, and keyboard.
2. Sit in an upright position using good posture.
3. Adjust monitor and copy stand side by side and at a comfortable viewing angle.
4. Set angle of monitor and copy to reduce glare.
5. Keep wrists and hands in line while using keyboard and mouse. Avoid bending wrists forward or backward.
6. When using a video display terminal, blink frequently to maintain eye surface moisture.
7. To prevent eye fatigue, momentarily focus eyes on a distant object.
8. When using a video display terminal for prolonged periods, frequently stretch and move head, neck, shoulders, and arms to prevent buildup of muscle tension.
9. Ensure chairs are easily and fully adjusted, and allow the body to shift position to the greatest extent possible. Use footrests when adjustments to the chair height do not relieve pressure under the thigh.
10. When continuously and simultaneously using the telephone and computer, use telephone headrest, headset, or speaker phone to prevent injury.
11. Organize work areas to avoid stretching/twisting to reach items.
12. Contact Design Management in Real Estate Services for evaluation of
work station conditions.

**Manual Transport/Storage**

1. When lifting, holding, or pushing, avoid strains and sprains caused by incorrect posture, lack of proper assistance, and/or lifting aids.

2. When handling materials, use the following techniques if mechanical equipment is not available:
   a. Lifting
      i. Keep the load close to your body.
      ii. Bend your knees and hips.
      iii. Lift with your legs.
      iv. Avoid twisting as you lift.
      v. Get help when needed.
   b. Bending
      i. Kneel on one knee.
      ii. Bend knees and hips, not your back.
      iii. When leaning forward, move your whole body, not just your arms.
   c. Repetitive motions
      i. Keep the load small.
      ii. Turn your whole body instead of twisting.
      iii. Get close to the load; do not reach and lift.
      iv. Lift with your arms and legs, not your back.
      v. Change positions frequently.
   d. Reaching
      i. Reach only as high as is comfortable; do not stretch.
ii. If you need to reach beyond your comfort level, use a ladder.

iii. Test the weight of the load before lifting. Let your arms and legs do the work, not your back.

e. Pushing and pulling
   i. Stay close to the load; do not lean forward.
   ii. Push the load rather than pulling.
   iii. Use both arms.
   iv. Get help when needed.
Fall Protection & Walking and Working Surfaces

General Fall Protection Requirements

1. Prior to beginning each job, an assessment must be performed to determine if fall hazards are present and if protective measures are needed. Workers must be informed of the fall hazards and protective measures.

2. Locations will have plans in place to rescue workers promptly if they fall while wearing fall arrest equipment. Rescue planning should minimize the amount of time a person is suspended in a fall arrest harness and may include provisions for self-rescue; calling local emergency services; or use of plant emergency responders.

3. When personal fall arrest equipment is required, it shall include a full-body harness with a shock-absorbing lanyard, retracting lanyard, or fall arrestor such as a rope grab. It may include other equipment for anchorage or attachment.

4. For maintenance activities, in elevated areas 4 feet or more above a lower level, and where guardrails or safety nets are not practical, workers shall use personal fall arrest equipment to prevent injury due to a fall.

5. For construction activities, see the table below for specific requirements.

6. Fall protection for wood poles, towers, and other transmission and distribution structures is described in the Electrical Safety for Transmission and Distribution, Fall Protection section.

7. Workers must rig fall protection equipment so that free fall is minimized (6 feet or less) and hitting obstructions or a lower level is avoided.

8. Anchorage points must be capable of withstanding 5,000 pounds of force per worker attached or shall be selected by an engineer as part
of a fall protection system with a safety factor of 2.

9. On vertical lifelines, each worker must have a separate lifeline with a breaking strength of at least 5,000 pounds.

10. Snaphooks, when used, shall be the locking type.

11. All fall protection equipment must be inspected before each use. Any defective pieces must be removed from service. Inspect for these defects:

<table>
<thead>
<tr>
<th>Inspect</th>
<th>For evidence of defect or damage including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>Cracks, Sharp edges</td>
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<tr>
<td>D-rings</td>
<td>Deformation, Corrosion</td>
</tr>
<tr>
<td>Buckles</td>
<td>Chemical attack</td>
</tr>
<tr>
<td>Connectors, etc.</td>
<td>Excessive wear</td>
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<tr>
<td></td>
<td>Alterations</td>
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<tr>
<td></td>
<td>Excessive heating</td>
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<tr>
<td>Ropes</td>
<td>Fraying</td>
</tr>
<tr>
<td>Straps</td>
<td>Unsplicing, Unlaying</td>
</tr>
<tr>
<td>Lines</td>
<td>Kinking, Knotting</td>
</tr>
<tr>
<td>Cables</td>
<td>Broken or pulled stitches</td>
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<td></td>
<td>Excessive elongation</td>
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<td>Excessive wear</td>
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<td></td>
<td>Excessive lubrication</td>
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<tr>
<td>Mechanical devices</td>
<td>Improper functioning</td>
</tr>
<tr>
<td>Rope grabs</td>
<td>Absence of parts</td>
</tr>
</tbody>
</table>

12. Body belts may be used for work positioning and travel restraint. Body belts may also be used with ladder safety devices where the
point of attachment to the harness is 9 inches or less. Do not use body belts for fall arrest.

13. Horizontal lifelines shall be designed, installed, and used under the supervision of a qualified person with a safety factor of 2. See References below for information on designing horizontal lifelines.

14. Workers who are on surfaces at any height above dangerous equipment shall be protected by a guardrails or fall arrest equipment.

15. Skylights shall be guarded by standard skylight screens or guardrails or personnel shall wear personal fall arrest equipment.

16. For personnel platforms secured to the forks of fork lift trucks, ensure:
   a. Workers are protected from moving parts of the truck and falling objects overhead.
   b. Platforms are at least 18 in. wide.
   c. The platform has guardrails or the worker wears fall arrest equipment.
   d. Platforms are secured to the forklift according to manufacturer recommendations.

17. For the nonworking side of loading docks with a fall hazard of 4 ft. or greater, install guardrails or ensure that workers wear fall arrest equipment. The working side of loading docks does not require a guardrail if it prevents work from being performed.

18. Workers working in the bucket of a bucket truck shall wear personal fall arrest equipment. Right-of-way workers may use a body belt with lanyard when working in a bucket.

19. Workers working on top of tanker trucks and rail cars shall use personal fall arrest equipment.

20. Personal fall arrest equipment is required for workers working from boom-supported elevating work platforms.

21. Workers working in scissor lifts shall be protected by guardrails or
personal fall arrest equipment if guardrails are not installed.

22. Protect lifelines against damage.

23. Do not use lanyards or lifelines that have knots.

24. Immediately remove from service personal fall arrest systems and components subjected to impact loading; do not re-use until a competent person inspects them and determines them undamaged and suitable for re-use. Work with your EHS professional for evaluation.

25. Do not attach personal fall arrest systems to guardrail systems or to hoists unless approved by a qualified person.

26. When a personal fall arrest system is used at hoist areas, rig it to allow the movement of the worker only as far as the edge of the walking/working surface.

27. Do not connect snap hooks to fixed eye bolts unless the snap hook is large enough that the eye bolt cannot break the keeper if the two become entangled.

28. When wearing a fall arrest harness, take precautions to ensure that the lanyard does not create a tripping hazard or get caught in rotating or moving equipment.

Walking and Working Surfaces

1. Before allowing workers to work on walking/working surfaces, ensure that such surfaces have the strength and structural integrity to support workers safely.

2. All floor surfaces must be kept clean, dry, and free of protruding nails, splinters, loose boards or grating, holes, or any other projections.

3. Drainage must be provided in areas of wet processes and mats should be provided where practical.

4. Every open-sided floor platform or runway 4 feet or more above an adjacent floor or ground level must be protected by a standard railing
consisting of a guardrail, midrail, and toeboard.

5. Every stairway with four or more risers must have stair railings.

6. Floor holes, hatchways, pits, chutes, or other floor openings must be covered or guarded by guardrails and toeboards.

7. A floor hole which is less than 1 ft. in least dimension and which provides for the passage of machinery, piping, or other equipment which may expand, contract, vibrate, and/or move, shall be at least guarded by a toeboard to prevent an worker’s feet from entering the hole and tools falling on workers below.

8. Ensure floor hole guards are in place at all times unless it is necessary to remove the guards temporarily. If the floor hole guards are removed, use guardrails or personal fall arrest equipment to protect workers from falling through holes that are more than 6 feet above lower levels.

9. Do not exceed the weight capacity of a floor hole cover.

Ladders

1. Use ladders only for the purpose for which they were designed.

2. When ascending or descending, workers shall face the ladder, use at least one hand to grasp the ladder, and not carry anything that could cause loss of balance or a fall.

3. Before each use, ladders must be inspected for defects or damage. Defective ladders must not be used, and they must be immediately removed and tagged out of service.

4. Ladders used to gain access to roofs, floors, platforms, landings, scaffolds, etc. must extend at least 3 feet above the access point or be secured at the top and provided with a grasping device to assist workers in mounting and dismounting the ladder.

5. Portable metal ladders must not be used in areas containing exposed energized electrical lines or equipment.
6. Ladders must not be placed against movable objects, and they must not be placed in doorways opening toward the ladder unless the door is open, locked, or guarded.

7. Ladders must be securely placed, held, or tied to prevent slipping and falling.

8. The area around the top and base of ladders must be kept free of tripping hazards, such as loose materials, trash, cords, hoses, loads, etc.

9. If ladders have to be set up in aisles or other passageways, they must be protected from fork trucks, material-handling equipment, and other traffic.

10. Working load on ladder must not exceed load limits of the ladder.

11. Portable ladders must be equipped with nonskid feet and, where appropriate, self-leveling feet. Ladders must not be placed on unstable bases such as boards, bricks, boxes, barrels, etc.

12. Portable ladders must be placed so that the distance between the bottom legs of the ladder and the supporting points is one-fourth of the ladder length between supports.

13. Two-section extension ladders must not exceed 48 feet in total length, and ladders with more than two sections must not exceed 60 feet in total length.

14. Portable ladders must not be used horizontally as scaffolds, runways, platforms, or as guys, braces or skids, or for anything other than their designed uses.

15. When using portable single or extension ladders and work requires both hands, secure the ladder and use personal fall arrest equipment or work positioning equipment.

16. Stepladders are to be used only with the legs fully extended and the spreader bar locked in place. Stepladders must not be used as straight ladders.
17. The top step of stepladders must not be used, except for platform ladders that are specifically designed for that purpose.

18. Cages, wells, ladder safety devices, or personal fall arrest equipment are required for ladders affixed to towers, tanks, or chimneys more than 24 feet in height.

19. Each ladderway floor hole or platform shall be guarded by a guardrail system with toeboards on all exposed sides (except at entrance) with the passage through the guardrail system provided by a swinging gate or offset such that employee cannot walk directly into the opening. Chains are not allowed at the top of fixed ladders.

20. Do not overload ladders. Pay attention to the duty rating of portable ladders:
   a. Type III: Light duty, household use, capable of supporting 200 pounds.
   b. Type II: Medium duty, commercial use, capable of supporting 225 pounds.
   c. Type 1: Heavy duty, industrial use, capable of supporting 250 pounds.
   d. Type 1A: Extra heavy duty, industrial use, capable of supporting 300 pounds.
   e. Type 1AA: Extra heavy duty, industrial use, capable of supporting 375 pounds.

**Repair pits**

1. Repair pits and assembly pits over four feet but less than ten feet deep do not need to be protected by a fall protection system, provided that the following requirements are met:
   a. Access within six feet of the edge of the pit is limited to authorized workers;
   b. Authorized workers are trained to recognize and avoid the
hazards involved with work around the pit area.

c. Floor marking in colors contrasting to that of the surrounding area are applied, or rope, wire or chain with support stanchions are placed at a distance of at least six feet from the edges of the pits;

d. Caution signs stating “Restricted area”, “Authorized employees only,” or a similar legend are used to limit entry into the area to authorized workers.

Mobile Ladder Stands

1. Do not move occupied units. Do not overload. Do not store materials or equipment on the step or platform.

2. Do not attempt to gain additional height by adding any type of extension or object on the unit.

3. Use handrails while ascending and descending.

4. Face the ladder when ascending or descending when the slope of the ladder is greater than 50 degrees above the horizontal.

5. Do not place occupied units in front of a door unless the door is secured.

6. Do not overreach. Keep the unit in close proximity to the work.

7. Use only on a level surface.

8. Access to or egress from any step or platform from any other elevated surface is prohibited unless the unit has been positively secured against movement. For units with solid guardrails around the top platform (e.g., not removable chains), do not climb over the guardrails to get to another elevated surface.
### Specific Requirements for Construction Activities

Fall protection requirements for specific construction activities are described below:

<table>
<thead>
<tr>
<th>For construction work on this surface:</th>
<th>The fall protection system required is:</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfaces with unprotected sides and edges 6 feet or more above lower levels. These are surfaces that are not listed below.</td>
<td>Guardrail system, safety net system, or personal fall arrest system.</td>
<td>Exception: If these are infeasible or create a greater hazard, develop and implement a fall protection plan. Fall protection plan is allowed ONLY for leading edge work; precast concrete work; and residential construction.</td>
</tr>
<tr>
<td><strong>Leading edges</strong> 6 feet or more above lower levels for workers engaged in the leading edge work. Erecting <strong>precast concrete members</strong> (including erection of wall panels, columns, beams, and floor and roof “tees”) and when performing related operations 6 ft. or more above lower levels <strong>Residential</strong> construction activities 6 ft. or more above lower levels.</td>
<td>Guardrail system, safety net system, or personal fall arrest system.</td>
<td>Exception: If these are infeasible or create a greater hazard, develop and implement a fall protection plan. Fall protection plan is allowed ONLY for leading edge work; precast concrete work; and residential construction.</td>
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</tr>
<tr>
<td>Workers who are working on a walking/working surface 6 ft. or more above a lower level where <strong>leading edges</strong> are under construction, but who are not engaged in the leading-edge work.</td>
<td>Guardrail system, safety net system, or personal fall arrest system.</td>
<td>Note: When a guardrail system is chosen and when a controlled access zone has already been established for leading-edge work, use, if desired, the control line instead of a guardrail along the edge that parallels the leading edge.</td>
</tr>
<tr>
<td><strong>Hoisting</strong> areas more than 6 ft. above lower levels.</td>
<td>Guardrail system or a personal fall arrest system.</td>
<td>Note: If guardrail systems are removed during hoisting operations, ensure workers leaning through the access opening or over the edge use personal fall arrest systems.</td>
</tr>
<tr>
<td>When working around <strong>holes</strong> (including skylights) more than 6 ft. above lower levels. This includes holes created by temporarily removing grating.</td>
<td>Personal fall arrest system, cover or guardrail system erected around the holes.</td>
<td>Cover holes (including skylights) to protect workers from tripping in or stepping into or through holes and objects falling through holes.</td>
</tr>
</tbody>
</table>
For construction work on this surface: | The fall protection system required is: | Additional information |
---|---|---|
**Formwork and reinforcing steel** 6 ft. or more above lower levels | Personal fall arrest systems, safety net systems, or positioning device systems. | |
**Ramps, walkways, and runways** 6 ft. or more above lower levels | Guardrail systems. | |
**Edges of excavations** 6 ft. or more in depth and when the excavations are not readily seen because of plant growth or other visual barrier. | Guardrail systems, fences, or barricades. | |
**Edges of wells, pits, shafts, and similar excavations** 6 ft. or more in depth | Guardrail systems, fences, barricades, or covers. | |
When working **less than 6 ft. above dangerous equipment** | Guardrail systems or equipment guards. | |
When working **6 ft. or more above dangerous equipment** | Guardrail systems, personal fall arrest systems, or safety net systems. | |
### For construction work on this surface:

<table>
<thead>
<tr>
<th>When engaged in overhand bricklaying and related work 6 ft. or more above lower levels.</th>
<th>Use guardrail systems, safety net systems, personal fall arrest systems, or controlled access zones. When reaching more than 10 in. below the level of the surface being worked on, use a guardrail system, safety net system, or personal fall arrest system.</th>
<th>Note: This does not apply to bricklaying done from scaffolds. (See OSHA, 1926, Subpart L.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>When doing roofing work on low-slope roofs with unprotected sides and edges 6 ft. or more above lower levels.</td>
<td>Guardrail systems, safety net systems, personal fall arrest systems or a combination of: - Warning line system and guardrail system when workers are outside the warning line; OR - Warning line system and safety net system when workers are outside the warning line; OR - Warning line system and personal fall arrest system when workers are outside the warning line; OR - Warning line system and safety monitoring system when workers are outside the warning line</td>
<td>Note: On roofs 50 ft. or less in width, using a safety monitoring system alone (without the warning line system) is permitted.</td>
</tr>
<tr>
<td><strong>For construction work on this surface:</strong></td>
<td><strong>The fall protection system required is:</strong></td>
<td><strong>Additional information</strong></td>
</tr>
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<tr>
<td>All work activities on low-slope <strong>roofs</strong> that are not related to roofing work.</td>
<td>Use fall arrest equipment if you are close enough to the edge to fall unless the perimeter is enclosed with guardrails or parapets at least 36 inches high.</td>
<td></td>
</tr>
<tr>
<td><strong>Inspections</strong> prior to the actual start of construction work or after construction work has been completed.</td>
<td>Fall protection is not required for inspection, investigation, or assessment of workplace conditions prior to the actual start of construction work or after all construction work has been completed. Fall protection is required for inspections that take place while construction work is underway.</td>
<td></td>
</tr>
<tr>
<td><strong>Steep roofs</strong> with unprotected sides and edges 6 ft. or more above lower levels</td>
<td>Guardrail systems with toeboards, safety net systems, or personal fall arrest systems.</td>
<td></td>
</tr>
<tr>
<td>For construction work on this surface:</td>
<td>The fall protection system required is:</td>
<td>Additional information</td>
</tr>
<tr>
<td>--------------------------------------</td>
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</tr>
<tr>
<td>When working on, at, above, or near <strong>wall openings</strong> (including those with chutes attached) when the outside bottom edge of the wall opening is 6 ft. or more above lower levels <strong>and</strong> the inside bottom edge of the wall opening is less than 39 in. above the walking/working surface</td>
<td>Guardrail system, safety net system, or personal fall arrest system</td>
<td></td>
</tr>
</tbody>
</table>

Where the potential for falling objects exists, use hardhats and do one of the following:

1. Erect toeboards, screens, or guardrail systems to prevent objects from falling from higher levels.
2. Erect a canopy structure, and keep objects far enough from the edge of the higher level to prevent their falling over the edge if they are accidentally displaced.
3. Barricade the area to which objects could fall, prohibit workers from entering the barricaded area, and keep objects far enough from the edge to prevent their falling over the edge if they are accidentally displaced.
For construction work on this surface: The fall protection system required is: Additional information

Scaffold erection and use  See the EHS Manual Scaffold Program

References:


Horizontal Lifeline Calculator Software available on the Duke Energy Portal

OSHA 1926 Subpart M and 1910.269
OSHA 1910 Subpart D and proposed revisions
EHS Manual programs for Steel Erection and Scaffolds
Handling Hazardous Chemicals/Substances

General Rules on Handling Chemicals

1. Before starting work, identify all hazardous substances involved with the work task. Hazardous substances can be chemicals involved in the work process, materials used, or coatings and insulation to be installed or removed.

2. Review the MSDS Sheet for hazard information when appropriate.

3. When working with hazardous materials/chemicals, be able to perform the following in an emergency situation:
   a. Identify an emergency situation.
   b. Know how and when to report the chemical emergency.
   c. Know local places of refuge/how to evacuate the area.
   d. Know appropriate decontamination procedures.

4. Observe the following work practices where hazardous substances (materials and chemicals) are present:
   a. Do not eat or drink; do not use tobacco products.
   b. Wash hands and face at breaks. (When appropriate, shower at the end of work task or shift.)
   c. Never blow on or shake off contaminated clothing, and never use compressed air to clean it.
   d. Place contaminated clothing in plastic bags and label.
   e. Using approved methods to reduce/eliminate the spread of contamination, clean contaminated work area.
   f. To prevent unnecessary personnel exposure, mark off the work area as necessary with ribbons, tapes, signs, or barriers.
   g. When a splash hazard exists, verify availability and location of eye-wash water, and shower before performing tasks.
h. Use personal protective equipment as specified by Material Safety Data Sheet, policy, Job Hazard Analysis or Safe Work Practice.

5. Conduct atmospheric monitoring as necessary to ensure a safe work environment.

6. Where hazardous chemicals/materials are used, stored, or disposed of in the workplace, use engineering controls (e.g., natural, forced, or local exhaust ventilation) to eliminate or reduce airborne concentrations of hazardous substances.

7. Respiratory protection equipment and personal protective equipment (including clothing) shall be specified by work procedures or qualified persons based on an evaluation of the hazard and the exposure levels.

8. When moving chemicals, ensure the following precautions are observed:
   a. Ensure that chemical containers are closed tightly and protected from damage.
   b. Ensure that glass containers containing dry chemicals are protected from breakage by placing them in appropriate outer packaging.
   c. If moving highly hazardous liquid chemicals in glass containers, place the glass containers in protective carriers before movement.
   d. Secure chemicals being moved on vehicles or pallets against movement by means such as banding, strapping, or tapping.
   e. Comply with Department of Transportation requirements where applicable.

Refrigerant Safety

Observe the safe work practices below when working with refrigerants.
1. Use safety glasses and protective gloves.

2. Avoid inhaling refrigerant vapors.

3. Ensure adequate ventilation in the area and forced ventilation at the service location to disperse all remaining refrigerant vapors.

4. Do not use oxygen or compressed air to pressurize appliances to check for leaks.

5. Use only nitrogen when purging equipment to remove remaining refrigerant and lubricant.

6. Always use a pressure regulator when charging a system with nitrogen.

7. Do not light torches or use open flames in areas where refrigerant vapors are present.

8. Refer to the Material Safety Data Sheet and equipment manufacturer’s recommendations for detailed information.

9. Know the proper operating limits of refrigerant recovery machines.

10. Ensure refrigerant charging lines/hoses are constructed of materials compatible with refrigerant used.

11. Store containers in a cool place away from direct sunlight and other heat sources and weather conditions.

12. Avoid placing containers in positions where falling could cause ruptures.

13. Close container valve and replace outlet with cap and gasket when not in use.

14. Do not reuse disposable containers for any purpose.

15. To prevent rupture, ensure that when charging, refrigerant containers are not connected to any system of higher pressure to prevent backflow and overfilling.

16. Do not use direct heating (e.g., flames, radiant heaters) to increase the rate of discharge of refrigerant from a container. Use only
approved methods such as controlled blanket heaters.

17. Do not overfill storage containers. Leave room for expansion.

18. Do not mix refrigerants. Put in only containers marked for that particular refrigerant.

19. Transfer/store refrigerant only in a container structurally suitable for that refrigerant.

20. Before transferring a refrigerant, inspect container for corrosion or damage that may weaken it.

21. Work with refrigerants only if you have the appropriate EPA certifications.

22. Never leave refrigerant cylinders exposed to direct sunlight.

23. Recover liquid trapped in tank liquid line used with recovery unit to prevent rupture of line and to prevent injuries from accidental liquid release.

24. Ensure that refrigerant recovery cylinders used in compliance with DOT inspection schedule.

Hydrogen

1. When unloading bulk hydrogen or working on pressurized systems containing hydrogen at 4% concentration or higher, wear the following personal protective equipment:
   a. Hard hat
   b. Safety glasses
   c. Face shield
   d. Leather gloves

2. When working on hydrogen systems containing a known leak, wear the following personal protective equipment:
   a. Hard hat
Safe Work Practices

b. Safety glasses

c. Face shield

d. Leather gloves

e. Flame-resistant clothing, recommended.

3. Where appropriate, refer to Job Hazard Analysis for tasks involving hydrogen systems.

Chlorine

1. When it is necessary to work on chlorine lines or equipment all sources of chlorine must be turned off at the source and the lines safely discharged and purged with dry air.

2. Only persons who have been properly trained should work on chlorine systems.

3. When working on chlorine systems appropriate PPE must be worn at all times.

4. Chlorine system enclosures must be posted with signs restricting entry and providing warnings of health hazards, fires and explosions.

5. Safety showers and eyewash stations must be provided within 25 feet of chlorine equipment.

6. In the event of a chlorine leak only properly trained responders, HazWoper Technician Level, should attempt to stop the leak.

Polychlorinated Biphenyls (PCB’s)

1. The major health concerns regarding PCB’s are ingestion and resulting bioaccumulation in the fatty tissues of humans, and skin contact, which can cause dermatitis. The following precautions are required when handling or working in areas where PCB’s may be present:

   a. No eating, drinking, smoking, chewing, or any other activity that could potentially cause the ingestion of PCB’s by
Safe Work Practices

employees is permitted when handling PCB liquid, equipment, or in areas where these activities are performed.

b. Skin contact must be avoided.

c. Should skin come in contact with PCB’s, employees must wash thoroughly with soap and water.

d. Gloves, protective coveralls, shoe covers, or other means must be used to prevent skin contact and to protect the worker’s clothing from PCB contact.

e. Respiratory protection may be needed where PCB-contaminated vapors or dust is airborne. Employees must follow procedures and practices established by their Business Unit Department in dealing with PCB’s.

Acid and Caustics

1. When acids or caustics are mixed with water, the acid or caustic must be poured into the water, not the water into the acid or caustic.

2. If it is necessary to enter a tank or vat to clean it, the employee entering must wear an approved hard hat or hood, rubber gloves, rubber or plastic outer clothing, and boots or shoes. They must also wear respiratory protection and a lifeline. The employees must be trained and work in accordance with the confined space requirements.

3. Hydrazine is toxic and caustic and must never be handled without adequate ventilation. Skin or clothing contact and the breathing of vapors must be avoided.

4. All small containers (such as bottles or jars) must be washed thoroughly when emptied. Carboys, steel drums, tank trucks, or tank cars must not be washed, but they should be completely drained of all acid before they are returned to the acid supplier.

5. Open flames and smoking are prohibited when working with or near acid in metal containers, such as tanks, condensers, or boilers.
6. Storage of acids and caustics:
   a. Acids, in any quantity, must be kept in an approved carboy or other container and prominently labeled. These containers must not be used for any other purpose.
   b. Acids must not be stored near heaters, steam pipes, or other sources of heat.
   c. Acid containers must be securely sealed or covered.
   d. Employees handling acids, caustics, or other corrosive and toxic chemicals must wear personal protective equipment such as gloves, aprons, eye and face protection, etc.
   e. Chemical pumps must be washed externally before they are repacked or used to perform maintenance work.
   f. Storage areas for acids and caustics must be posted with appropriate warning signs.

7. Handling of Acids and Caustics
   a. Personal protective equipment and clothing must be worn whenever acids or caustics in harmful quantities could spill, splash, or drip on the person handling them. The quantity of acid or caustic handled will determine the kind and quantity of clothing and equipment.
   b. Should any acids, caustics, or other chemicals come in contact with the eyes, they must be thoroughly washed out with a large amount of running water for 15 minutes. A physician must be consulted as soon as possible. The eyes should not be rubbed.
   c. Approved emergency eyewash/shower must be available within 25 feet in areas where acids and caustics are handled.
   d. Before a carboy or other acid container is lifted or moved, it must be examined carefully to see that it is not leaking or defective. The wire holding the carboy stopper in place must be checked to see that it has not corroded and that the stopper
is secure. All involvements must be made slowly to avoid excessive agitation of the acid.

e. Before the unloading of acid from a tank car or tank truck is begun, the acid storage tank must be gauged to see if there is adequate space inside to contain the acid being added without its overflowing.

f. When tank cars or trucks are unloaded, warning signs must be prominently posted and the unloading area barricaded.

**Lime and Limestone**

1. The hazards of lime include:
   a. Lime is irritating to the eyes and mucous membranes.
   b. It may cause dermatitis.
   c. The dust is an irritant with an alkali pH.
   d. It is corrosive to metals.

2. First Aid: Wash affected area with water for at least 15 minutes.

3. Storage: Label well and keep dry.

4. PPE required: Use face shield or goggles, gloves, and respiratory protection when handling.

**Mercury**

1. Mercury is corrosive to metals. The vapors can be inhaled and absorbed through the skin. It will affect the respiratory system, the skin, eyes and internal organs. It may damage kidneys and nervous system.

2. Mercury will vaporize at room temperature.

3. First Aid: In case of ingestion or over-exposure, see a doctor immediately.

4. Storage: Label well and keep in a tightly closed container.
5. Handling: Avoid careless handling and spillage. Follow procedure for spills.
6. PPE required: Use rubber gloves when contact is required.

Molten Sulfur

1. Sulfur is used in generating stations. It is received and stored in the molten state to facilitate handling, metering, transportation, and processing.

2. Molten sulfur is found in the molten sulfur storage tank, metering pumps, burner/converter box and in interconnecting piping.

3. Hazards of molten sulfur include:
   a. Can be ignited.
   b. Burning sulfur produces sulfur dioxide, an irritating, toxic and asphyxiating gas.
   c. Dust particles may be irritating to the eyes, nose, throat and skin.
   d. May cause thermal burns.

4. Molten sulfur may release hydrogen sulfide (toxic gas) which may accumulate in storage container vapor space. High concentration can cause loss of consciousness and death. Hydrogen sulfide causes eye irritation.

5. Eye contact with molten sulfur can cause serious burns and blindness.

6. First aid:
   a. Eye contact: Using eyewash station, flush eyes with water. Seek medical attention.
   b. Skin contact: Remove contaminated clothing. Wash contaminated areas with soap and water. Obtain medical
c. Ingestion: Do not give liquids or induce vomiting. Obtain immediate medical attention.

d. Inhalation: Remove person to fresh air. Seek medical attention.

7. Personal protective equipment for working with molten sulfur includes: thermal protective clothing and gloves; rubber boots; face shield and goggles; respiratory protection; hard hat.
Hazard Communication

1. Before starting work, all hazardous chemical products involved with the work task should be identified.
   a. Hazardous substances can be chemicals involved in the work process, materials used, or coatings and insulation to be installed or removed.

2. Before working with new or unfamiliar chemicals, employees should review the MSDS for:
   a. Hazards posed by the chemical.
   b. Health effects of overexposure.
   c. Recommended safe work practices, including recommended personnel protective equipment (PPE) and proper safe storage information.

3. Employees must be aware of how to access Material Safety Data Sheets (MSDS) for hazardous chemicals with which they work.
   a. For hard copy MSDS:
      i. Employees must know the location of the MSDS.
      ii. The MSDS must be kept accessible (e.g. not locked up on back shifts).
   b. For electronic MSDS systems:
      i. Employees must be provided easy access to terminals to view MSDS.
      ii. Employees must either be trained on how to access MSDS online or information on how to access MSDS provided to them (e.g. posters).
      iii. If only online MSDS are used at a site, universal access must be available to all employees (i.e. cannot be limited only to employees with active computer
4. Use only materials/chemicals that are appropriately labeled.

5. Notify a safety and health representative or your supervisor if a label is missing or cannot be read. They will arrange for re-labeling.

6. Unless advised otherwise, follow label instructions for chemical use and storage.

7. When transferring chemicals to a second container, obtain and use a secondary container chemical label.
   a. Methods for obtaining secondary labels may vary between sites. If unsure, contact your health and safety representative.
   b. The sole exception for labeling of secondary containers is when a single employee uses that container within a single shift. Container should remain in their possession.

8. Use only chemical products that have been approved for use in Duke Energy operations.
   a. Do not use a credit card or purchase card to obtain chemicals, except in an emergency.
   b. If emergency purchase is necessary, ensure that an MSDS is obtained for the chemical and is provided to an Environment, Health and Safety (EHS) professional. The EHS professional should evaluate the MSDS prior to the chemical being used.

9. Personnel who initiate a request for a new chemical purchase or a change to existing chemical stock must ensure that an MSDS is obtained for the material.

10. Add any new or additional chemicals to the site chemical inventory.

**Work practices associated with contractors and work at non-Duke Energy sites**

1. Contractors must provide information to Duke Energy on hazardous chemicals they bring on sites. MSDS for those chemicals must be provided to Duke Energy on request. The sole exception is for
chemicals that will be stored on contractors’ vehicles and not be used on Duke Energy sites.

2. Contractors must be informed of hazardous chemicals at Duke Energy sites to which their employees may be exposed. MSDS must be made available on request.

3. Duke Energy personnel working at non-Duke Energy sites must provide information and MSDS on request to that site for any hazardous chemicals brought in by Duke Energy.
Health & Safety Incident Reporting and Investigation

1. Report all health & safety incidents to your supervisor immediately and document accurately. Health and safety incidents include the following: near miss, occupational injury / illness, vehicle or mobile equipment accident, fire, explosion, or any damage to property because of the previously identified events.

2. If a health and safety incident occurs take the necessary action to limit the harm and stabilize the situation without jeopardizing your personal safety or health.

3. Preserve the incident scene until important evidence can be documented.

4. Duke Supervisors report all significant health & safety incidents to Duke Energy Corporate Communications by calling 1-888-266-3853 or your assigned communicator. Significant incidents to report include:
   a. Employee fatality or significant life-threatening or life-changing injury resulting in hospitalization or response by off-site emergency responders;
   b. Contractor fatality, public fatality, or significant injuries resulting in hospitalization related to company actions or facilities;
   c. Vehicle accidents causing significant injuries or fatalities to employees or others;
   d. Terrorism;
   e. Significant fires, explosions or other industrial accidents such as building or structural collapse

5. Supervisors immediately report all health & safety incidents to your manager and your Health & Safety support group. Within 24 hours of incident complete the initial reporting form accurately documenting the facts of the incident and forward to Health & Safety.
6. Supervisors begin the incident investigation within 24 hours of the incident occurring. Incidents will be categorized into one of three classes for determining the type of investigation according to consequence, severity, and probability of recurrence. Contact your Health & Safety support group to determine the type investigation needed.

   a. Category I incidents involving employees or contractors are the most serious and require a formal root cause investigation using an approved methodology led by a trained investigator and conducted by a team approved by senior management. The investigation must identify root causes and recommendations. The corrective actions shall be approved by management and tracked to completion.

   b. Category II incidents involving employees require a root cause investigation performed by a trained investigator using an approved methodology with identified root causes and recommendations approved by management, implemented, and tracked to completion to prevent recurrence.

   c. Category III incidents involving employees or contractors require only completion of an eTRAC Incident entry.

7. Duke Contractors are expected to investigate their incidents and provide a written report to the Duke Energy project manager/liaison/job sponsor. If they are unable to do so Duke will perform the investigation. Contact your Health & Safety support group for assistance.

8. Line management should consider the need for fitness for duty testing after a work-related recordable injury or preventable vehicle crash.
Hearing Conservation

Wear appropriate hearing protection in areas posted or anytime communication between individuals is difficult due to high noise. Consult an EHS professional for the appropriate level.
Hexavalent Chromium

1. Ensure the identification of activities that may produce hexavalent chromium \([\text{Cr-VI, Cr}^+6, \text{Cr(VI)}]\) or disturb Cr-VI containing materials. Activities of concern include:
   a. Hot work (e.g. grinding, cutting, welding operations) on coated (painted) surfaces or chromium-containing steels (particularly stainless steel);
   b. Welding or thermal cutting of any steel in confined spaces;
   c. Spray painting with chromium-containing paints and primers;
   d. Maintenance on or demolition of structures that contain hexavalent chromium (paints and stainless steel);
   e. Removal or encapsulation of hexavalent chromium-containing materials;
   f. Construction, alteration, repair of structures or components that contain hexavalent chromium;
   g. Work activities disturbing flyash, ceramic bricks; or treated wood; and
   h. Hexavalent chromium contamination/clean-up.

2. If such activities occur, an exposure determination must be performed to determine the potential level of exposure. This determination may involve exposure monitoring on the workers (company and/or contractor), as determined by management or EHS professionals.

3. Where exposure concerns exist, exposure control methods must be employed, including:
   a. Substitution of less hazardous materials or processes;
   b. Engineering controls (such as ventilation);
   c. Work practices (such as equipment wash downs or vacuuming, vacuuming and proper disposal of work clothing, hand/face
Safe Work Practices

washington, etc.);

d. Establishing “regulated areas” for activities or areas where the exposure limit might be exceeded; and

e. Use of personal protective equipment (such as coveralls, gloves, safety glasses, face shield, etc.) and respiratory protection.

4. Where protective clothing and equipment is required for hexavalent chromium protection, use change rooms, with separate, contamination-free, storage facilities for street clothes.

5. Do not take contaminated clothing home.

6. Do not wear dusty or contaminated clothing into break rooms, lunch rooms or other areas where food and drink are stored or consumed.

7. Remove contamination from coveralls (or other clothing), using a method that does not put dust into the air (e.g. vacuum dust from work clothing with a HEPA vacuum).

8. Where used, empty or change HEPA vacuums/filters in accordance with department or site work practice, to minimize exposure and to ensure appropriate waste disposal.

9. Never blow off, shake off, or do anything else to contaminated materials that could send dust or particulate debris into the air.

10. Never sweep, shovel or brush Cr-VI dust or contaminated products (e.g., paint debris, abrasive blast) unless vacuuming or other relevant methods have been tried and found ineffective. (Note: Obtain management approval before using one of these methods.)

11. Never carry coveralls, protective equipment, or other contaminated materials home.

12. Wash face and hands before breaks and at end of shift.

13. Certain activities, such as eating, drinking, smoking, chewing gum or tobacco, or applying cosmetics are prohibited in regulated areas.
14. Affected workers must receive information (training) on hazards and protective measures of Cr-VI.

15. Waste bags, bags of clothing or equipment, or other containers of Cr-VI materials must be labeled according to the Hazard Communication program requirements.

16. Medical surveillance must be provided for workers exposed at or above the action level for thirty or more days per year.
Hot Work Program

1. The first step to performing hot work is to move the work, when possible, to a safe area where the danger of fire does not exist. When this cannot be done, the hot work permit must be issued.

2. The hot work permit is required for any temporary operations involving flames, or producing heat and/or sparks.

3. Before performing welding, cutting, or grinding evaluate and safeguard the work area for combustible items.

4. Use the facility or location specific hot work permit.

5. Before using the hot work permit, be familiar and understand the requirements.

6. Assign a fire watch with a suitable fire extinguisher to welding, cutting, and grinding operations in work area with combustible materials or where the fire or sparks cannot be contained in the immediate work area.

7. When using a fire watch, continuously monitor the hot work area and for 30 minutes following the completion of work, then perform final inspection.

8. Ensure the person assigned to fire watch has been properly trained.

9. Fire watch training consists of fire extinguisher training and proper hot work training for the activity being performed in accordance with OSHA 29CFR1910.252.

10. If a hot work permit is required for the job, ensure that the permit is properly completed and work is performed in accordance with the permit.

11. When the permit is terminated, return it to the proper location.

12. Inspect the work area and remove/cover any combustible materials.

13. Have the atmosphere tested for the presence of flammable gases, if applicable.
14. When welding, cutting, or grinding in elevated areas, cover the grating as much as possible and post a fire watch below as needed including multiple levels.

15. Before applying heat, thoroughly clean, decontaminate, and/or purge machinery, tanks, drums etc. that could contain toxic, explosive or combustible/flammable materials.

16. Use welding screens whenever other persons could be exposed to welding, cutting or grinding operations.

17. Keep welding, cutting, and grinding areas clean and free from accumulations of trash, rags, and other combustible items.

18. While performing any hot-work operations, dress appropriately to protect exposed skin from sparks, radiant heat, and hot surfaces.

19. For all hot-work processes in congested areas, (e.g. boilers, preheaters, feed-water heaters, and moisture separator reheaters) wear clothing appropriate for welding.

20. When extreme conditions exist, wear leather sleeves, aprons, and welding coats.

21. When performing welding/cutting operations, eliminate the possibility of sparks being caught in cuffed pants.

22. For contractors or subs working at a generation site or location, follow the location’s hot work permit process and procedure issued and controlled by the facility.

23. For contractors and subs working at locations other than generation facilities; after approval by a Duke Energy representative; the contractor employees will follow the agreed upon welding, cutting, hot work procedure issued and controlled by the facility.

24. Documentation for contractors performing hot work in corporate setting will be maintained in a central location owned and controlled by the Duke Energy facility.
Grinding Safety

1. Assemble electric and pneumatic grinders according to the manufacturer’s recommendations.

2. Inspect grinders before use to ensure the grinder is in good repair and all guarding devices are properly attached and adjusted.

3. Ensure guards on 90-degree grinders are between the user and the wheel.

4. Before installing a grinding wheel, check the grinder to ensure the spindle speed does not exceed the maximum operating speed indicated on the wheel.

5. Before changing wheels or rocks, disconnect grinders from energy source.

6. Keep hand-held grinders in control until the wheel or rock comes to a complete stop.

7. Operate and control grinders according to manufacturer’s recommendations (1 hand-/2 hand-operations).

8. For pedestal or bench grinders:
   a. Where tool rests are used, adjust them to a maximum of 1/8 in. from the wheel.
   b. Ensure the distance between the surface of the wheel and the adjustable tongue at the top never exceeds 1/4 in.
   c. Ensure wheel or rock comes to a complete stop before you leave the area.

9. Before installing wheels on stationary grinders, ring-test them to ensure integrity.

10. Ensure that the rated RPM for the grinder does not exceed the RPM rating for the rock/disk.

11. Use the following required personal protective equipment:
   a. Gloves (except when grinding tooling bits too small to be
handled with gloves)
b. Face shields
c. Hearing protection
d. ANSI-approved safety glasses with side shields
e. Wear monogoggles, safety glasses, and a face shield if the severity of the tasks requires additional protection to ensure against eye injury such as when grinding in a windy area or grinding above eye level.
Housekeeping

1. Keep individual/team work areas orderly, clean, and free of hazards.
2. Properly dispose of scrap and waste materials at frequent and regular intervals or at the end of each shift.
3. Keep walkways and work surfaces free of oil, grease, water, ice, and other slippery materials.
4. Keep walks, aisles, stairways, and all other passageways clear of obstructions.
5. Identify, cover, or mark temporary cables or cords passing through work areas.
6. Eliminate tripping hazards or restrict access to the area.
7. For trash, recyclables, and other waste materials, do the following:
   a. Keep waste in approved and properly labeled containers.
   b. Keep oily rags in a covered, listed (UL/FM) container.
   c. Safeguard sharp objects before disposal.
8. Ensure staged equipment does not create unsafe conditions by obstructing safe access to operating or emergency equipment or by overloading weight limits.
9. Use adequate lighting to perform work safely.
Inorganic Arsenic

1. Use respirators, coveralls, gloves and other personal protective equipment as specified by supervision or health and safety for work in inorganic arsenic regulated areas.

2. Vacuum coveralls (and shoes) with a HEPA vacuum before breaks and lunch and at the end of the work shift if wearing coveralls out of the regulated area. Note: Leave the respirator on while removing contaminated coveralls.

3. Wash face and hands prior to break. Shower at the end of the work shift.

4. Never shovel or sweep flyash and dust particulate (slag) unless vacuuming or other relevant methods (wet wash down) have been tried and found ineffective. (Note: Obtain management approval before using one of these methods.)

5. Where protective clothing and equipment is required for inorganic arsenic protection, use change rooms, with separate contamination-free storage facilities for street clothes.

6. Do not take contaminated clothing home.

7. Do not wear dusty or contaminated clothing into break rooms, lunch rooms or other areas where food and drink are stored or consumed.

8. Ensure that inorganic arsenic-contaminated protective clothing is:
   a. Removed at end of the task or end of the shift (whichever comes first); and
   b. Placed in closed container and labeled as follows:

   **CAUTION**

   Clothing contaminated with inorganic arsenic.

   Do not remove dust by blowing or shaking. Dispose of inorganic arsenic contaminated wash water in accordance with applicable local, state or federal regulations.
9. Remove contamination from coveralls (or other clothing), using a method that does not put dust into the air (e.g. vacuum dust from work clothing with a HEPA vacuum).

10. Where used, empty or change HEPA vacuums/filters in accordance with department or site work practice to minimize exposure and to ensure appropriate waste disposal.

11. Never blow off, shake off, or do anything else to contaminated materials that could send dust or particulate debris into the air.

12. Never carry coveralls, protective equipment, or other contaminated materials home.

13. Certain activities, such as eating, drinking, smoking, chewing gum or tobacco, or applying cosmetics, are prohibited in regulated areas.

Reference:
OSHA 1910.1018
Language Issues for Contractors

Contractors are responsible for ensuring that:

1. At least one bilingual person is available at all jobsites where non-English speaking persons are working for the purposes of safety and hazard related communications, emergency response, and similar issues.

2. All written and verbal safety training, hazard communications, and work rules are provided in the appropriate language for non-English speaking employees.
Lead in Construction

1. Identify activities that may disturb lead-containing materials. Activities of concern include:
   a. Disturbance (e.g. sanding, scraping, grinding, cutting, abrasive blasting, welding) of painted surfaces;
   b. Spray painting with lead-containing paints and primers;
   c. Maintenance on, or demolition of, structures that contain lead (paints, solder and roof flashing);
   d. Removal or encapsulation of lead-containing materials;
   e. Construction, alteration, repair of structures or components that contain lead; and
   f. Lead contamination/clean-up.

2. Support exposure assessment efforts (air monitoring) to determine if lead exposure exists.

3. Support efforts (make suggestions) on how to substitute less hazardous materials (such as chrome-free paints) or processes (such as paint strippers) as the first choice to eliminate the airborne exposure potential.

4. Use exposure control methods, including:
   a. Engineering controls (such as mechanical ventilation);
   b. Work practices (such as limiting work time, vacuuming and proper disposal of work clothing, hand/face washing, etc.);
   c. Limiting access into work areas for activities where the exposure limit might be exceeded; and
   d. Use of personal protective equipment (such as coveralls, gloves, safety glasses, face shield, etc.) and respiratory protection.

5. Follow written compliance plans.
6. Where protective clothing and equipment is required for lead protection, use change rooms, with separate contamination-free storage facilities for street clothes.

7. Do not wear contaminated clothing into break rooms, lunch rooms or other areas where food and drink are stored or consumed.

8. Do not carry coveralls, protective equipment, or other contaminated materials home.

9. Ensure that lead-contaminated protective clothing is:
   a. Removed at end of the lead task or end of the shift (whichever comes first); and
   b. Placed in closed container and labeled as follows:

   **CAUTION**
   
   Clothing contaminated with lead.
   
   Do not remove dust by blowing or shaking. Dispose of lead-contaminated wash water in accordance with applicable local, state or federal regulations.

10. Remove contamination from coveralls (or other clothing), using a method that does not put dust into the air (e.g. vacuum dust from work clothing with a HEPA vacuum).

11. Wear respiratory protective devices for any lead-disturbing work, unless the work activity has specifically been identified as not requiring respirators.

12. Follow all company and/or location-specific requirements of the respiratory protection program.

13. Empty or change HEPA vacuums/filters in accordance with department or site work practice, to minimize exposure and to ensure appropriate waste disposal.

14. Do not blow off, shake off, or do anything else to contaminated materials that could send dust or debris into the air.
15. Do not sweep, shovel or brush lead dust or contaminated products (e.g., paint debris, abrasive blast) unless vacuuming or other equally effective methods have been tried and found ineffective. (Note: Obtain management approval before using one of these methods.)

16. Wash face and hands before breaks and at end of shift.

17. Shower at the end of the shift after performing activities where lead concentrations exceed the PEL.

18. Do not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in areas where lead work occurs.

19. Complete appropriate lead training.

20. Collect, handle, label and properly dispose waste material (such as removed paint, abrasive blast material, HEPA filters, contaminated clothing or equipment) (see EHS support for specific requirements).

21. Inform supervisor or location EHS support of concerns.
Lockout/Tagout for Facilities Other than Transmission, Distribution, and Generation

1. Employees shall be trained in the requirements of the Lockout/Tagout program prior to performing tasks that require lockout/tagout.

2. Identify all hazardous energy sources associated with the work activities.

3. Isolate hazardous energy sources, tag and lock energy-isolating devices, and relieve stored hazardous energy as described in the Lockout/Tagout Compliance Program.

4. Before beginning work, verify by testing or operation that hazardous energy has been relieved.

5. Before restoring hazardous energy, verify work is complete and persons are clear of equipment.

6. Management and contractors will inform each other of their respective lockout/tagout procedures.

7. At generating plants, follow business unit specific procedures for lockout/tagout.

References:
OSHA 1910.147 and 1910.333
Machine Guarding and Portable Power and Hand Tools

General

1. Before starting work using powered machinery or tools, ensure that guards:
   a. Are in place so as to prevent contact with dangerous, moving parts by any part of the body (e.g., hands, arms) or clothing.
   b. Are firmly secured to the machine, if appropriate, and are made of durable material that will withstand the conditions of normal use.
   c. Do not create new hazards by having a shear point, jagged edge, or an unfinished surface that can cause a laceration.

2. Report any broken or missing guards to your supervisor and do not use the tool until repairs have been made.

3. Before working, perform a pre-job safety assessment to identify potential hazards to the hand.

4. Be aware that wearing work gloves over jewelry will not eliminate the hazard of mashing or pinching the hand.

5. When working around machinery with rotating or moving parts:
   a. Ensure gloves, ties, loose clothing, and long hair do not become entangled in equipment
   b. Tie back long hair
   c. Button or properly roll up long sleeves, and tuck in shirttails
   d. Do not wear loose jewelry (e.g., necklaces, chains, cords) outside clothing
   e. Wear badge straps of a breakaway-type of material

6. Where machines generate flying materials, protect the operator or passers-by with appropriate shielding.
7. Wear personal protective equipment (PPE) as required.
8. Do not use PPE as a substitute for adequate machine guarding.
9. Do not substitute eye shields (e.g., chip deflectors) for eye protection.
10. Do not bypass, remove, or tamper with guards.

Power Tools

1. Powder-Actuated Tools
   a. Do not operate a powder-actuated tool unless you are trained and qualified for the operation of the particular tool to be used.
   b. Tools must be tested each day before loading (in accordance with the manufacturer’s recommended procedure) to ensure safety devices are in proper working condition.
   c. Do not load tools until just prior to the intended firing time. Never point a loaded or empty tool at any person. Keep hands clear of the open barrel end.
   d. Loaded tools must not be left unattended.
   e. Do not use tools in an explosive or flammable atmosphere.
   f. Use the correct shield, guard, or attachment recommended by the manufacturer, when using the tool.

2. Chain saws:
   a. Do not operate a chain saw unless the manufacturer’s safety devices are in proper working order. Do not remove or modify any chain saw safety device.
   b. Ensure that the chain saw is equipped with a constant-pressure switch that will shut off the power or with a properly adjusted chain brake that will stop the chain when pressure is released.
   c. Wear the appropriate personal protective equipment when operating a chain saw. PPE includes leg chaps (when not in a bucket), safety glasses, and hearing protection.
3. Table saws:
   a. Ensure that exposed portions of the saw blade and drive belts are guarded.
   b. Verify the blade is the proper type for the material being cut.
   c. Wear required PPE including:
      i. Safety Glasses
      ii. Face Shield
   d. Use the blade guard assembly (hood, splitter, and anti-kickback device) for all cutting operations.
   e. Keep the splitter aligned with the sawblade.
   f. Keep the anti-kickback pawls in place and sharpened.
   g. Utilize push sticks.
   h. Push the workpiece past the saw blade prior to release.
   i. Adjust the saw blade so that it is no higher than 1/4” above the height of the workpiece.
   j. Do not saw a workpiece larger than can be controlled.
   k. Never saw a workpiece with loose knots, flaws, nails, or other foreign objects.
   l. Never have your body in-line with blade.
   m. Never start the machine with the material against the blade.

4. Band saws:
   a. Keep the wheel covers secured in place while operating the saw.
   b. When sawing, expose only the amount of blade needed to make the cut.
   c. Wear required PPE including:
      i. Safety Glasses
ii. Face Shield

d. Lower the blade guard when the saw is not in use.

e. Use proper blade for material being worked.

f. Adjust blade guard so that it is approximately 1/8” above the workpiece.

g. Never start the saw with material against the blade.

h. Keep material flat on the saw table.

5. Bench and Pedestal Grinders:

a. Before using a bench or pedestal grinder, ensure that it has the following safety devices in place:

   i. Side guard covering the wheel

   ii. Tongue guard, an adjustable metal guard extending down from the top of the grinder, which is adjusted to within 1/4 inch of the grinding wheel

   iii. Eye shields are clean and properly adjusted

   iv. Work rest adjusted to within 1/8 inch of the grinding wheel

b. Stand to the side for a few seconds during initial start-up.

c. Do not grind on the side of the wheel unless it is specifically designed for this type of work.

d. Prior to installation, test grinding wheels for cracks by using the ring test.

e. When changing grinding wheels, make sure the rated speed of the wheel matches the spindle speed of the grinder and is the proper size to fit the grinder.

f. Do not grind soft metals (aluminum, lead, brass, etc.) unless the wheel is designed for those metals. If the wheel is loaded with a metal, re-dress the wheel and test for cracks.
g. Keep the grinding wheel dressed and in good working condition.

h. Replace the grinding wheel if it is cracked or chipped, worn down to the blotter, or vibrates excessively.

6. Pneumatic (air-powered) tools:
   a. Ensure that the tool is secured to the air hose or whip by a positive means to prevent the tool from being accidentally disconnected.
   b. Ensure that all hoses exceeding 1/2-inch inside diameter have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.
   c. Safety clips or retainers for impact tools must be the proper size and securely installed and maintained.
   d. Do not exceed the manufacturer’s safe operating pressures.

7. Compressed air:
   a. Hoses with an inside diameter exceeding 1/2 inch must have a safety device at the source of supply or branch line to reduce pressure in case of hose failure or disengagement of a connection.
   b. Compressed air must not be used to clean unless:
      i. The pressure is reduced to less than 30 psi; or
      ii. Safety nozzle is installed on the blow down device; and
   c. Do not use compressed air to blow dirt or dust from clothing.
   d. Do not exceed the manufacturer’s recommended operating pressures on tools.

8. Mechanical Power Presses
   a. Before operating a mechanical power press, make sure:
      i. The point of operation is guarded in a way that
prevents reaching over, through, under, or around the guard.

ii. Hand and foot controls have guards that prevent inadvertent operation.

b. Before operating a press, inspect it to ensure that there are not damaged or missing parts or guards. Document the inspection as required.

c. Use safety blocks wherever dies are adjusted or repaired in the press. Brushes, swabs, or other tools should be used for lubrication to prevent reaching into the point of operation.

d. When servicing, maintaining or setting-up mechanical power presses, lockout/tagout procedures must be used.

9. Radial Arm Saws

a. Prior to use, ensure that:

i. The upper portion of the blade is protected by a hood

ii. The lower portion of the blade is protected by a guard that automatically adjusts to the thickness of the stock

iii. The arm has a stop to prevent the blade from traveling past the end of the table

iv. The saw is adjusted so that it returns to the rear when released after the cut is made; and,

v. A spreader and an anti-kickback device are provided when ripping

b. Do not reach across the work while sawing.

c. Do not attempt to cut small stock that cannot be held with the hand and fingers well away from the blade. Use another tool.

d. Wear required PPE including:

i. Safety Glasses
Safe Work Practices

ii. Face Shield

e. Never start the machine with material against the blade.

10. Portable Electric Tools

a. Inspect the tools prior to use. If damaged or the guard is missing, do not use the tool until it is repaired and the guard replaced.

b. Do not remove the guard from any portable electric tool without prior permission from management or Safety and unless the work itself provides adequate guarding.

c. Use the tool only for its intended purpose.

d. Use only those accessories that are approved by the manufacturer.

e. Do not hand-hold stock when cutting with an electric saw.

f. Do not hand-hold metal parts when drilling.

g. Do not use dull blades.

h. Do not use electric cords for hoisting or lowering tools.

11. Hydraulic Tools

a. Do not exceed the manufacturer’s safe operating pressures for tools, hoses, pipes, filters, and fittings.

b. Do not use regular or impact sockets on hydraulic wrenches.

c. Relieve the pressure before breaking connections unless quick-acting, self-closing connectors are used.

d. All hoses used on or near energized electrical equipment must be made of insulated materials.

12. Lathes (Metal)

a. Ensure that the chuck (work-holding device) is guarded when:

   i. In the clamped mode, it has components that extend beyond the outside diameter of the chuck; or
Safe Work Practices

ii. The periphery of the body of the chuck is of irregular shape; or,

iii. When a pinch point is created and the operator is not effectively protected by location, machine components, or other means from coming in contact with the projections.

b. Use a chip or coolant shield, or other safeguarding means, when necessary to prevent chips or coolant from being thrown or splashed on the operator, aisle, or other employees or work areas.

c. Wear eye and face protection regardless of a chip or coolant shield.

d. Do not wear gloves when operating the lathe.

e. Do not wear loose clothing or dangling jewelry.

f. Ensure that long hair is tied back and secured.

13. Milling and Drilling Machines

a. Do not wear loose clothing or dangling jewelry.

b. Secure long hair with a cap or hair net.

c. Use a chip or coolant shield, or other safeguarding means, when necessary to prevent chips or coolant from being thrown or splashed on the operator, aisle, or other employees or work areas.

14. Battery Powered Hand Tools

a. Batteries shall not be left connected to tools when not in use.

b. Tools shall not be stored with external batteries connected.

15. Drill Presses

a. Wear required PPE including:

   i. Safety glasses
ii. Face Shield

b. Guards must be utilized to prevent the operator from contacting the rotating chuck and spindle.

c. Never start the machine with the drill bit, cutting tool, or sanding drum against the workpiece.

d. Properly lock the drill, cutting tool, or sanding drum in the chuck before operating the machine.

e. Use only drill bits, cutting tools, or other accessories with the shank size recommended in the instruction manual.

f. Use only drill bits, cutting tools or sanding drums that are not damaged.

Hand Tools *(including personal tools)*

1. Each tool must only be used to perform the job for which it is intended.

2. Personal tools used on the job are subject to all requirements and safe work practices.

3. Prior to their use, inspect hand tools for defects. Remove defective tools from service for repair or replacement.

4. Metal rules, metal rope lines, or other tools with metal extending through the handle are not to be used on or near energized electrical circuits or equipment.

5. Mushroomed heads or cracks in chisels, punches, drift pins, and other impact tools must be dressed, repaired, or replaced before using.

6. Do not use pipe or other extensions (“cheaters”) to increase the leverage on wrenches.

7. Keep edge-cutting tools sharp.

8. When using knives or other sharp-edged cutting tools, always cut
9. Do not throw tools between other employees or locations. Use a tool bucket or other suitable container and hand line to raise or lower tools between elevations.

10. When striking a chisel, punch or wrench with a hammer, avoid hand-holding the chisel or punch.

11. Do not strike hardened tools, such as hammers, against each other.

12. Use diagonal or side cutters or other suitable tool to cut tie wraps. If a knife must be used, always cut away from any body part.

13. Tools with sharp edges should have guards when stored or in transit to work locations.
Means of Egress, Fire Prevention and Protection

Means of Egress

1. Keep exits and exit ways unobstructed.
2. Do not lock or secure any exit door in the closed position.
3. Do not store any flammable or combustible material in an exit way or stairwell.
4. Fire doors and dampers must never be tied, blocked in the open position, or otherwise made inoperative.
5. Do not block alarm pull stations.

Fire Prevention

1. Ensure that you know how to recognize and report hazardous conditions and fire hazards associated with the materials and processes to which employees are exposed.
2. Practice good housekeeping in all buildings and vehicles to prevent the accumulation of flammable and/or combustible material.
3. Keep flammable liquids in approved containers, properly labeled, and store in designated cabinets or storage areas away from sources of ignition.
4. Gasoline may be stored in 1.5 gallon plastic DOT fuel cans that are properly labeled.
5. Flammable and combustible liquids in excess of 1.5 gallons must be stored in properly labeled approved safety cans.
6. Do not store combustible materials in a flammable liquids storage area.
7. Return flammable liquids and aerosols to designated storage areas when not in use.
8. Keep flammable liquids storage cabinets and rooms closed.
9. Smoke only in designated areas.
10. Know and follow the site’s requirements for the use and handling of oily rags.
11. Take unused wooden pallets to the designated outside storage area.
12. Do not transfer flammable liquids into containers unless the nozzle and container are electrically interconnected (bonded).
13. Do not dispense flammable liquids by gravity from tanks, drums, barrels, or similar containers except through a listed self-closing valve or self-closing faucet. (Listed means tested and listed by a recognized testing laboratory (e.g., UL, FM).)
14. Do not use flammable or combustible liquids for general cleaning purposes.
15. Conduct the washing of parts with flammable or combustible liquids in equipment listed and approved for that purpose.
16. Locate and use parts-washing equipment in areas adequately ventilated to prevent accumulation of vapors.
17. Keep parts-washing equipment closed when not in use and ensure that the fusible-link closure is intact and operational.
18. Do not store compressed gas cylinders with flammable or combustible liquids.
19. Do not place objects or materials in front of electrical panels or disconnects so as to restrict clear access to the equipment.
20. Keep electric control panel covers in place and/or doors closed.
21. Do not store supplies or other materials inside electrical rooms or cabinets.
22. Ensure that small appliances (coffee makers, toasters, etc.) are used in accordance with the UL rating. (Check the specifications plate on the appliance.)
23. Do not use portable space heaters without prior approval from your supervisor and site management.

24. Conduct spray finishing operations only in approved designated areas.

Fire Protection

1. Report any damaged or spent portable fire extinguishers to your supervisor or local safety personnel.

2. Access to fire extinguishers or other fire protection equipment must not be blocked or restricted.

3. Do not use a fire extinguisher or other fire protection equipment unless you are trained and designated to do so.

4. Fire or smoke detection devices may contain radioactive parts. Before disposing of any used or damaged fire or smoke detection device, contact the local EHS support person.
Methylene Chloride

1. Through Hazard Communication, be aware of the chemical product you are working with and its chemical contents.

2. Be aware that the company is trying to eliminate the use of methylene chloride at its facilities where feasible.

3. Only methylene chloride products that have been approved by senior management will be allowed on the property.

4. If you find a chemical product that contains methylene chloride, stop the use of the product immediately and notify your supervisor or safety & health professional.

5. Only chemical laboratories and certain nuclear areas use methylene chloride products at this time.

6. If you have the potential to be exposed to methylene chloride, you will need to have specific methylene chloride training beyond normal Hazard Communication requirements.
Motor Vehicle Operations

Occupant Restraints

1. When riding in a vehicle, all occupants must use provided seats and wear seat belts.

2. Ensure all passengers are secured (e.g., seat belts fastened, doors closed) before moving the vehicle.

Impaired Driving

1. Never operate any vehicle while impaired.

2. If involved in a motor vehicle incident, the driver may be subject to an appropriate Fitness for Duty (FFD) investigation per business unit guidelines.

3. It is up to supervisory discretion to consider the use of a substance abuse screen in situations where it is believed that it is warranted, or, in situations where multiple preventable accidents have occurred to the same individual.

Distracted Driving

1. Texting and reading texts is prohibited when driving company vehicles and when driving personal vehicles on company business.

2. Reading or using laptop computers while driving on company business is prohibited.

3. Be aware of any state or local regulations that prevent you from using cell phones when driving.

4. Minimize cell phone use while driving to keep focused on the primary task of driving.

5. When you must use a cell phone while driving, minimize distractions by using hands-free devices, speaker phone, or voice-operated dialing
features or preferably let incoming calls roll over to phone mail to respond later.

6. Put on any hands-free accessories before driving. Adjust any other equipment (e.g. GPS) at this time.

7. Be familiar with your phone and its features (e.g., speed dial, redial). If you determine it’s safe to take or make a call while driving keep calls short to limit distraction.

8. Use pagers or radios responsibly while driving.

9. Avoid any other activities that may distract your driving. Pull over or park to perform any such activities.

**Use of Hand Held Cell Phones**

1. Use of hand held cell phones is prohibited by all employees and contractors when driving commercial motor vehicles. Hand held cell phones shall not be used to make or receive phone calls; send or receive text messages or emails; or access other applications (Internet, etc.) while driving commercial motor vehicles. Use of hands free devices is allowed but only if the call can be initiated, answered, or terminated by touching a single button on the cell phone or headset.

2. Power Delivery and Gas Operations employees and contractors shall not use a hand held cell phone while driving any motor vehicle on company business unless it is paired with a hands free device. The use of a hands free device is allowed if the call can be initiated, answered, or terminated by touching a single button on the cell phone or headset.

**Aggressive Driving**

1. Operate all vehicles in a safe manner, using defensive driving techniques.

2. Do not drive aggressively. Aggressive driving includes:
Safe Work Practices

a. Speeding
b. Tailgating
c. Failures to signal a lane change
d. Running red lights and stop signs
e. Weaving in traffic
f. Yelling
g. Making obscene gestures
h. Excessive or inappropriate use of the horn

Operational Practices

1. Operate all vehicles according to applicable Department of Transportation (DOT) regulations.
2. Do not operate a vehicle until all windows are free of dirt, ice, snow, frost, or anything that obstructs clear vision.
3. Do not operate motor vehicle without authorization and a valid state operator license or permit applicable for the type of vehicle operated.
4. Before operating a vehicle, visually inspect it to determine whether the vehicle is safe to operate.
5. Before operating, become familiar with the vehicle’s controls.
6. When driving a commercial vehicle, perform and document post-operational and pre-operational inspections, according to current DOT regulations.
7. While operating a motor vehicle, observe all traffic rules and regulations.
8. Before opening doors, observe traffic conditions.
9. Do not carry loose items on the front floors, front seat, rear window, or dash.
10. Do not ride in trailers or other similar operating equipment being towed.
11. Report any defects noted while operating a vehicle. Correct unsafe operating conditions before further use. Do not tow mobile equipment without using an approved hitch and safety chains adequate for the load.

12. Use wheel chocks when provided with the vehicle. Chocks are required for vehicles with dual rear wheels.

13. Chock trailers when not coupled to the towing vehicle to prevent rollaway.

14. Follow department specific guidance for additional details on application of wheel chocks if applicable.

15. Set the brakes on any truck/trailer and place wheel chocks under the rear wheels to prevent the trucks or trailers from rolling when they are boarded with powered industrial trucks.

16. Always remain alert to other vehicle movements.

17. During refueling, turn vehicle ignition off, do not smoke or use other portable electronic devices.

18. During refueling, attend the nozzle.

19. When possible, position vehicle to eliminate need to back up.

**Backing**

1. If you can pull through into a parking place, do so, instead of backing the vehicle into the space.

2. When any vehicle with an obstructed view to the rear has to be backed, a guide shall be used when available.
   a. If a guide is not available, a 360\(^\circ\) walk-around inspection should be performed and obstructions and other hazards in the pathway of the vehicle shall be identified and avoided.
   b. Prior to moving a parked vehicle, look under and around the vehicle.
Safe Work Practices

c. For the safety of the guide, the vehicle shall come to a complete stop before driver takes eyes off of guide.

3. Vehicular equipment having an obstructed view to the rear may not be operated in reverse unless:
   a. There is no person(s) exposed to the hazards created by the moving vehicle.
   b. The vehicle has a reverse signal alarm audible above the surrounding noise level.
   c. A designated employee signals that it is safe to do so.

4. When the vehicle is backing up, the vehicle’s horn should be used to alert the surrounding area to the backing.

Pre-driving Preparation

1. Plan your trip to allow extra time to arrive at your destination.
2. Visually inspect it to determine whether the vehicle is safe to operate.
3. Secure loose items to prevent them from rolling around during movement.
4. Make appropriate adjustments to mirrors, seats, windows, etc. before driving.
5. Review maps and/or driving direction in advance.
6. Put on your seat belt.

Periodic Vehicle Checks

1. Visual checks shall be made by drivers each time a vehicle is to be operated. These visual checks include:
   a. Gauges
   b. Fuel and fluids
   c. Wheels and tires
d. Mirrors and mirror adjustment

e. Windscreen, including wipers

f. Lights, including headlights and directional, and brakes

**Emergencies**

1. In case of any vehicle trouble (e.g., a flat tire), pull off to the right side of the road, if possible, and use emergency flashers and warning signals.

2. In case of an accident:
   a. Stop the vehicle immediately or as near the accident as practical.
   b. Put on a traffic vest if one is available.
   c. Give assistance, and obtain medical first aid.
   d. Call the police, and notify supervisor as soon as possible.
   e. Exchange names, addresses, and vehicle insurance information.
   f. Do not discuss who is at fault.
   g. Get names of any witnesses to the accident
   h. Remain at the scene until you are no longer needed.

3. Dial 911 or a local emergency number to report serious emergencies. Call the control room for emergencies on generation plant property.

4. For roadside assistance while driving a company vehicle, call the emergency number provided by Fleet Services.

5. Appropriate emergency equipment to have in company vehicles may include (but is not limited to):
   a. First aid kit
   b. Flashlight
c. Reflective safety vest
d. Space blanket
e. Light sticks
f. Fire extinguisher
g. Tire inflator/sealant
h. Reflective triangles/flares
i. Cold weather emergency items
j. Disposable camera

**Incident Reporting and Analysis**

1. If an employee is in an accident involving a company vehicle, complete a vehicle/ powered equipment entry in eTRAC Incident.

2. If an employee has an injury from any kind of vehicle accident while on company business, complete an injury/illness entry in eTRAC Incident.

3. Employees who receive a citation for any of the violations listed below while operating any Duke Energy owned vehicle, must immediately report the citation to their supervisor and the appropriate DOT File Administrator:
   - a. Moving violations or parking violations issued by law enforcement.
   - b. Commercial motor vehicle driver “Out of Service” (OOS) violations issued by DMV.
   - c. Violations for vehicle being overweight, over height, or over length issued by the DMV.

**Work Zone Safety**

1. Follow state and local regulations for establishing safe work zones. In Power Delivery, follow procedures for work zone setup. For more
information, see the EHS Manual.

References:
ANSI/ASSE Z15.1-2006
Office Safety

1. Immediately clean up spills.
2. Mark wet floors with warning signs until the area is dry.
3. Keep power, phone, and cords clear of doorways and other areas where they can be pinched by the opening and closing of doors.
4. Guard tripping hazards, then mark/identify them, and report them to the responsible group for repair.
5. Keep desk, file, or cabinet drawers closed when not in use. To prevent tipping of file cabinets, do not open more than one drawer at a time.
6. Wherever possible, store large, heavy objects on lower shelves and smaller, lighter objects on top shelves. When items are stored on top shelves, position or secure them so they cannot fall.
7. Keep all chair legs on floor while seated.
8. Do not run in hallways or up and down stairs. Use handrails where provided.
10. Never use electrical equipment when hands are wet.
11. Keep combustibles to a minimum.
12. When moving heavy or bulky items, remove contents, use correct lifting techniques, and get assistance.
13. At the end of each workday or shift (if there is no oncoming shift), turn the power off on small appliances (e.g., coffee makers, space heaters).
14. Remove from service, disconnect, or repair all malfunctioning or faulty electrical equipment.
15. Do not use more plugs than an outlet is designed for. If additional outlets are needed, use power strips appropriate for the use.
16. Do not stand on chairs, desks, or tables.

17. Be familiar with and operate all office equipment according to manufacturer recommendations, and ensure all safety devices are in place and operable.

18. Do not use paper cutters unless the guards are in place; do not leave the blade in the up position.

19. Do not tamper with or ignore guards on office machinery.

20. Before moving office furniture, remove the contents.

21. Electric-powered portable heaters must be approved by management, attended while in use, turned off after normal working hours, and kept at least 3 feet away from combustible materials.

22. When sitting in office chairs, do not prop feet up on desk or table to avoid causing the chair to tip over.

23. In office locations, monitor food while it is cooking in microwaves, toasters, and toaster ovens.

24. Do not use exercise balls (Swiss balls) or similar objects as seating instead of standard office chairs, unless required by a doctor.
Paint Chip Cleanup

1. Before cleaning up paint chips, determine if the chips contain asbestos, lead, or hexavalent chromium. If chips contain asbestos, lead, or hexavalent chromium, this section applies.

2. Determine how long the clean up is expected to last.

3. If cleaning paint chips is expected to take more than 15 minutes, contact your location EHS professional.

4. If clean-up can be accomplished in less than 15 minutes, use one or more of these options:
   a. Manually pick up paint chips and place in a plastic bag.
   b. Use a High Efficiency Particulate Air (HEPA) filtered vacuum that has been designated for use with asbestos or lead.
   c. Use a tack cloth or roller.

5. In addition, comply with these requirements:
   a. Do not sweep, blow, or vacuum paint chips with a vacuum that is NOT a High Efficiency Particulate Air (HEPA) filtered vacuum.
   b. Do not use compressed air to clean paint chips.
   c. Do clean the area in a pattern that will minimize stepping on or crushing the paint chips.
   d. As necessary, have the vacuums emptied and cleaned by appropriately trained personnel.
   e. Store the collected paint chips and waste in waste receptacles labeled for asbestos or lead.
Pedestrian Safety

1. Cross streets in designated crosswalks.
2. Look for oncoming vehicles in all directions before walking into the street. Make eye contact with motorists, if possible.
3. When crossing streets, avoid using mobile communication devices if possible.
Personal Protective Equipment

General Requirements

1. Personal Protective Equipment (PPE) provides essential protection against injury and illness and as such it must be kept in a clean and reliable condition, free of defects or damage and be capable of providing the necessary protection. Any PPE that is degraded, damaged, worn out or otherwise in disrepair shall be discarded and shall not be used for protection.

2. A hazard assessment must be performed before PPE is issued or used, in order to ensure that the prescribed PPE is appropriate for the hazard(s) present.

Eye and Face Protection

1. Eye and face protection that complies with acceptable consensus standards (such as ANSI Z87.1) must be used whenever there is a hazard due to particles, fumes, liquids, gases or radiation that could injure the eyes. Minimum protection shall consist of safety glasses with side shields. Side shields must meet applicable standards for quality, durability and protective ability.

2. Safety glasses with tinted lenses may only be used for outside work in bright environments. Individual business units may allow the indoor use of semi-mirrored lenses that have only a slight or minimal tinting.

3. Prescription safety glasses with transition tinting that change from light to dark are allowed if a risk analysis indicates that no additional or unnecessary risk is added because the tinting does not change rapidly enough from dark to light to allow for safe movement from bright to dark environments.

4. Prescription glasses that do not meet acceptable consensus standards may not be worn in areas where eye protection is required without at minimum overglasses that meet these requirements.
5. Goggles must be worn where a risk of chemical splash is present. Unvented goggles should be used where chemicals that are eye irritants and have high vapor pressures are used. Goggles may be worn over regular prescription glasses to provide protection equivalent to safety glasses with side shields.

6. When face shields are used, safety glasses with side shields or equivalent must be worn beneath the face shield.

7. Welders must use shaded eye protection appropriate for the type of welding or cutting being performed. A table with minimum shade requirements can be found in OSHA regulations at 29CFR1910.133(a)(5).

8. Work with lasers above Class IIIa requires eye protection as determined by the Laser Safety Officer assigned to evaluate the work and shall be appropriate to the type of laser and energy of the beam being used.

9. Eye and face protection shall be distinctly marked with the identity of the manufacturer.

10. Contact lenses may be worn as long as additional appropriate eye protection is provided. Contact lenses may not be worn when exposure to eye irritants (chemical or mechanical) is likely. Examples include work in areas where airborne particulates such as flyash are present or where chemical vapors that are eye irritants such as chlorine are present. Contact lenses may be worn with full-face respiratory protection if allowed by the individual Business Unit.

Head Protection

1. Head protection must be used whenever employees are exposed to injury due to falling objects.

2. Hardhats or helmets must meet or exceed acceptable standards such as ANSI Z89.1.

3. In order to improve communication and security and facilitate the Tell
Safe Work Practices

Me program, hardhats used on Duke Energy Corporation property or in work areas controlled by Duke Energy Corporation should bear the name or logo of the employer and the name of the employee. Names of employees should be omitted when working outside of Duke Energy Corporation controlled work areas, such as when working directly with the public or in certain special cases where risk of injury would be greater if personal information was displayed on a hardhat.

4. Hardhats must be worn in their proper orientation, usually brim forward, unless using a helmet or suspension specifically designed to accommodate a face shield for welding, cutting or grinding purposes.

5. Where electrical hazards are present, hardhats must be completely non-conductive, including the suspension and any hat-mounted accessories. Hardhats used to provide protection from electrical hazards must meet the requirements for Class E (formerly Class B) high voltage (up to 20 kV) or Class G (formerly Class A) low voltage (up to 2000 V).

Foot Protection

The following table describes appropriate footwear for a variety of work environments:

<table>
<thead>
<tr>
<th>Work Environment</th>
<th>Footwear Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office/administrative areas</td>
<td>Use a risk assessment to determine appropriate footwear for the type of business environment.</td>
</tr>
<tr>
<td>Normal working conditions</td>
<td>Footwear with slip-resistant soles and substantial uppers made of leather or the equivalent that covers the entire foot and has no openings.</td>
</tr>
<tr>
<td>Tasks with known hazards</td>
<td>Specific required footwear (e.g., chemical-resistant boots, ice cleats, dielectric boots, shoes with a defined heel, lineman’s boots)</td>
</tr>
</tbody>
</table>
### Work Environment Footwear Requirement

<table>
<thead>
<tr>
<th>Work Environment</th>
<th>Footwear Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where danger of foot injury exists from falling and rolling objects or from objects that might pierce the foot</td>
<td>Footwear must meet nationally recognized consensus standards such as ANSI Z41 or ASTM F2412/2413 and have safety toe caps (metallic or composite) and steel shanks when protection against penetration is required. Clip-on protective toe caps may be worn over regular shoes. Where warranted by the hazards, footwear must be worn that also includes metatarsal protection.</td>
</tr>
<tr>
<td>Step or touch potential and other electrical hazards including underground cable work</td>
<td>Dielectric footwear which complies with ASTM F1117 must be worn in accordance with Power Delivery Safe Work Practices and Standard Procedures.</td>
</tr>
</tbody>
</table>

### Hand Protection

1. Gloves appropriate to the task shall be used to protect the hands and wrist area from exposure to heat, cold, water or steam, chemicals, sharp edges, abrasion, electrical contact and other hazards as necessary. Gloves may also be used for protection against dirt and other non-toxic materials, as well as while operating machinery or handling materials.

2. Gloves must never be used while working near rotating machinery where the glove could get caught and pull the hand into the machine. Certain portable electric tools such as hand drills and hand-held abrasive grinders may be used while wearing gloves as long as both hands are used to hold the tool while it is working.

3. Gloves used for personal protection against electrical contact must be tested in accordance with Duke Energy Corporation requirements for the testing and use of dielectric rubber goods.

4. Consult with Health and Safety Technical Support or your site safety representative for assistance in selecting proper hand protection.
Body Protection

1. Protective clothing shall be used whenever hazards that could cause injury to the body are present, including but not limited to arc flash, chemical exposure, protection against cold or heat, exposure to dirt, dust or liquids, whether toxic or not, or exposure to hazardous materials in an emergency response action.

2. Work in short trousers is generally prohibited. Short trousers are defined as pants that do not cover the leg below the knee and may only be worn if a hazard analysis shows that there are no hazards to the lower legs that could be mitigated by the use of long trousers.

3. Work in bare torsos is prohibited. Sleeveless shirts are prohibited where there are hazards to the arms that could be mitigated by the use of long sleeves.

4. Protective clothing worn in laboratories must be suitable for the purpose and provide protection specific to the chemicals or materials being used.

5. Turnout gear for fire fighters must comply with applicable NFPA standards and be cared for and maintained according to those standards.

6. Clothing contaminated or potentially contaminated with toxic dusts or materials must remain on site and be disposed of or laundered under the control of Duke Energy Corporation.

Training

1. Each employee or contractor working at a Duke Energy Corporation site or work zone shall have received training on the topic of personal protective equipment in accordance with this program.

2. Before any Duke Energy Corporation employee or contractor shall be allowed to perform work that requires the use of PPE, they must demonstrate an understanding of the training they have received and demonstrate the ability to properly use the PPE.

References:

OSHA 29CFR1910 Subpart I
Powered Industrial Trucks

A powered industrial truck is a mobile, power driven truck used to carry, push, pull, lift, stack, or tier material. These requirements do not apply to trucks used for earth moving, for over-the-road haulage, or for elevating work platforms (e.g., scissor lifts).

1. All operators of powered industrial trucks must be trained and evaluated on the operating instructions, warnings, and precautions for the types of truck the operator must be authorized to operate.

2. Powered industrial trucks must be inspected before being put into service each day. If the powered industrial truck is used round-the-clock, it must be inspected before each shift. The inspection must be documented using the Duke Energy Daily Inspection for Powered Industrial Trucks form or a form that contains the same information.

3. All powered industrial trucks must be equipped with seatbelts. Seatbelts must be used and properly adjusted by operators.

4. Powered industrial trucks may be equipped with an ABC fire extinguisher that is properly sized for the potential hazards that may arise during operation. This is not required; but if equipped, training must be provided to operators on how to use.

5. If at any time a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, immediately remove it from service. Notify the department supervisor so he or she can notify the person responsible for making repairs.

6. When operating a powered industrial truck, always travel with the forks approximately six inches from the ground so they clear any uneven surfaces.

7. Ensure there is a safe clearance and headroom for equipment operation through aisles and doorways.

8. When the load you are carrying obstructs your view always travel in reverse or use a “spotter”.

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9. Keep all body parts inside the driver’s compartment and away from the mast, carriage, moving chains or other parts that are a pinch-point or shear-point hazard.

10. Never add additional counter weight to a powered industrial truck to allow for lifting a heavy load.

11. Drive at appropriate speeds. All traffic regulations shall be observed, including authorized plant speed limits.

12. Do not carry passengers on the powered industrial truck unless it is designed for that purpose.

13. Sound the horn when turning a blind corner.

14. Never drive up to a person standing in front of a fixed or stationary object.

15. Do not allow any person to stand or pass under elevated portions of any powered industrial truck, whether loaded or empty.

16. When powered industrial truck operators working on elevated platforms (e.g. order pickers) that are four feet above a lower level appropriate fall protection devices must be worn.

17. When traveling behind other powered industrial trucks or vehicles, always maintain at least three truck-lengths from the vehicle or powered industrial truck ahead, and maintain control of the powered industrial truck at all times.

18. Protect against accidents or damage by making sure that the vehicle and load weights do not exceed floor limits and that the raised mast or overhead guard clears all overhead obstacles, lights, pipes, sprinklers, heaters, overhead tracks and doorways.

19. Slowly approach ramps and inclines straight, not at an angle.

20. Never turn the powered industrial truck while on a ramp or incline.

21. When parking a powered industrial truck and prior to dismounting or leaving the unit, shut off the power. Never leave a running powered industrial truck unattended.
22. Before leaving a powered industrial truck unattended, lower the load-engaging means, neutralize the control, shut off the power, set the brakes, and turn off the ignition key. Chock the wheels if the truck is parked on an incline.

Note: A powered industrial truck is considered unattended when the operator is 25 feet or more away from the vehicle which remains in the operator’s view, or whenever the operator leaves the vehicle and the truck is not in view.

23. Do not use trucks in areas of poor lighting unless they are equipped with auxiliary directional lighting and the lighting is turned on.

24. Never park a powered industrial truck in front of any fire protection equipment, emergency exits, or in a manner that would obstruct a person from exiting the area.

25. When refueling or recharging the batteries of a powered industrial truck, ensure that the powered industrial truck is shut-off and the parking brake is engaged.

26. Refuel or recharge the powered industrial truck only in areas that are designated and well ventilated.

27. Wear gloves, arm protection (long sleeves) and a face shield when working with battery electrolyte.

28. When working with electrolyte, know the location of the nearest emergency eyewash/shower station.

29. To allow heat and potential flammable off-gases to dissipate, leave the battery cover or compartment cover open during the charging of batteries. When replacing or closing the cover, take care not to let it slam shut, which could cause a spark or personal injury.

30. Never smoke in refueling and recharging areas. Fuel vapors and gases, which can escape from the battery and fuel vents, are extremely flammable.

31. Keep tools and other metallic objects away from the top of uncovered
batteries.

32. Ensure that an ABC rated fire extinguisher is present in all refueling or recharging areas.
Radiofrequency Devices and Exposure

Exposure

1. Radiofrequency exposures from cell phone antennas on transmission towers, antennas on rooftops, wireless devices on distribution poles, and other devices shall be evaluated and communicated to exposed employees.

2. Employees shall obey all posted signs, assume all antennas are active, and maintain safe distance from all antennas.

Wireless Devices and Antennas on Poles and Street Lights

The following procedures shall be followed when working on or around distribution or street light poles with antennas or wireless equipment attached:

1. Look for signage related to Radio Frequency Exposure.

2. Where no signage or a blue “Notice” signage exists, employees may work without restrictions.

3. Where yellow “Caution” or red “Warning” signage exists, employees shall:
   a. Contact the PDWC, provide them with the name of the company and the phone number located on the sign and have the PDWC notify the company that the electrical disconnect will be operated turning the power off to the installation.
   b. Turn off the power to the wireless devices at the disconnect switch.
   c. Complete all work on the pole.
   d. Turn on the power to the wireless device at the disconnect switch.
   e. Contact the PDWC, provide them with the name of the company and phone number, and request them to notify the owner of the equipment that power to the installation has been restored.
   f. Note: Where a pole must be replaced for damage, inform PDWC.
Transmission Towers with Antennas and Microwave Devices Attached

1. Minimum requirements for ascending towers:
   a. Do not climb towers with unsafe accumulations of snow and ice.
   b. At least two employees shall be on site when anyone is on a tower.
   c. At least two employees trained in first aid/CPR shall be on site.
   d. Employees shall inspect base of tower prior to climbing.
   e. Complete Communication Tower Daily Safety Checklist initially and every day work is performed. Checklist is available in the Power Delivery Civil Lines Manual. Completion of checklist is required by NC-OSHA. It is optional elsewhere.
   f. Fall protection is required at heights above 6 feet.

2. Before beginning work on a transmission tower with cell phone antennas or microwave devices, employees or supervisors planning the work shall:
   a. Assess potential RF hazards. Identify type of antennas on this tower.
   b. Determine if RF Safe Distances described below can be maintained for the work planned. If RF Safe Distances cannot be maintained, contact supervisor to have antennas de-energized.
   c. Ensure yellow RF Caution signs are in place at the base of the tower.
   d. Be trained and authorized to perform the work.
   e. Obey all posted signs.
   f. Assume all antennas are active.

3. Employees shall maintain safe distances from antennas. Safe distances from transmitting antennas have been determined by calculation and field measurements. The following are working distances by employees spending extended periods of time in the
area. Momentary passage through an area, as would be the case of an employee climbing a tower, has been determined to be safe.

**Panel Antennas**

Maintain four feet working distance from the front of panel antennas. Being closer than four feet to the side, bottom, top and back of the antennas is not a hazard.

**Omni Directional Vertical Antennas**

Maintain four feet safe working distances around omni-directional antennas in all directions.

**Microwave Dish Antennas**

Microwave dish antennas are to be assessed on an individual basis. Do not look directly into a microwave dish or into an open waveguide. Employees are not to access areas within 10’ of the front of a transmit microwave dish in the main beam of the signal. If work is to be performed in these areas contact the communications department.

4. If antennas are on the tower assume a Yellow RF Caution environment exist even if the Yellow RF Caution Signs are not in place at the base of the tower. Notify supervisor if the signs are not posted at the location.

**Antennas and Microwaves on Rooftops**

Obey all signs and barricades. Contact Duke Energy Telecommunications Department for access.

**Radio Use in Generating Facilities**

When adding new equipment or performing services that require a radio at a Duke Energy generation station, the radio frequencies to be utilized by the equipment must be approved by the Duke Energy job sponsor (Engineer, Project Manager, Equipment Owner, etc) prior to installation or use.
Radiography

1. In generating plants, notify Control Room before beginning radiography.

2. Radiation restricted areas must be established by the radiographer before exposing the radiation source.

3. Restricted areas must be identified by magenta and yellow “DANGER RADIATION” signs and tape. Radiation signs should be posted in English and Spanish if the workforce is non-English speaking.

4. Only authorized individuals are permitted inside established radiation restricted areas.

5. Authorized individuals entering radiation restricted areas must be appropriately trained and have personnel radiation dosimeters (e.g., film badges, alarming rate meters).

6. Individuals needing access into a radiation restricted area must contact the Control Room.

7. Employees should listen to Control Room Operator’s public address announcements related to radiography testing.
Respiratory Protection

1. Use acceptable engineering controls to control harmful gases, smokes, dust, mist, sprays or vapors as the primary method to prevent airborne exposures.

2. If engineering controls are not feasible, appropriate respiratory protection must be used.

3. Before using a respirator or being fit tested, the user must receive medical clearance.

4. Any time a respirator is worn, the wearer must be clean shaven between the respirator sealing surface and the face or that interferes with valve function.

5. The user must receive respiratory protection training and fit testing before putting a respirator on.

6. The user must inspect respirators before use.

7. The user must perform positive and negative pressure fit checks each time the respirator is put on, to verify proper fit and operation.

8. The user must exit the contaminated work area and remove respirator if breathing difficulty, taste or smell any contaminant or respirator malfunction occurs.

9. Do not leave respirators unprotected in contaminated work areas during breaks or intermittent work.

10. The user must be familiar with proper care and cleaning requirements for the type of respirator being used.

11. Store the respirator in a sealed plastic bag.

12. Do not store respirators on their sealing surface. This may distort the face mask.

13. Where appropriate, the employee must return issued respirators to the designated collection point after each use for proper cleaning, inspection, maintenance and storage.
14. Employees must only use Company approved respiratory protection.

15. The employee will notify their supervisor, a health and safety professional, or management of medical changes or concerns when wearing respiratory equipment.

16. Follow appropriate instructions for voluntary use of disposable respirators where it has been determined that no respiratory hazard exists.

17. Provide suggestions, feedback and concerns about the respirator program or your respirator to your supervisor or health and safety professional.
Safe Usage of Pesticides

1. Have on site the pesticide product’s Material Safety Data Sheet (MSDS)

2. Review the MSDS and the product label before performing pesticide work.
   a. If the label is missing or unreadable, do not use the product and contact your Health and Safety representative.

3. Personal protective equipment

4. Follow directions on the pesticide label and MSDS for proper personal protective equipment.

5. Unless stated otherwise on the label or MSDS, at a minimum wear the following:
   a. Long-sleeved shirt and full-length trousers, or long-sleeved coveralls;
   b. Non-canvas or nonporous shoes or boots;
   c. Safety glasses or face shields; and
   d. Neoprene gloves.

6. Do not handle contaminated clothing with unprotected hands.

7. Reusable clothing
   a. After each day’s use, launder reusable clothing.
   b. Do not launder contaminated clothing with normal household clothing.

8. Disposable clothing
   a. After each day’s use, discard disposable clothing.
   b. When several applications are scheduled at different locations in a single day, reuse disposable clothing if the garment is in reasonably good condition (e.g., no heavily soiled, saturated, or
Safe Work Practices

torn areas).

c. Place contaminated disposable clothing in impervious waste bags, and label as to the type of pesticide contamination.

d. Contaminated reusable personal protective equipment (i.e. hardhat, gloves, boots)

e. At the end of each day, use detergent and clean water to wash reusable Personal Protective Equipment (PPE) that has been contaminated.

f. Dry this equipment in a clean, dry place.

9. Respiratory protection

a. If you are required to wear respiratory protection, ensure that you are trained, fit tested and medically qualified to do so.

b. Contact your health and safety consultant to determine proper respiratory protection, respirator cartridge selection and cartridge change-out schedule.

c. Replace your cartridge(s) if pesticide odor is detected during its usage.

d. Dispose of used cartridges at the end of the shift. Do not re-use the next day.

e. Clean and disinfect respirators after each use.

f. Do not use single-use dust masks for pesticide work.

10. To minimize or eliminate potential personal exposure to pesticides through inhalation, ingestion, and/or skin absorption:

a. Never eat, drink, or smoke when handling pesticides.

b. Do not wear jewelry while handling pesticides.

c. Wash hands thoroughly with soap and water after handling, mixing or applying pesticides.

11. If accidental exposure occurs or you believe that you have an illness
or injury associated with pesticide use:

a. Follow the first aid guidelines given on the manufacturer’s label and/or the MSDS.

b. Contact your supervisor.

12. Apply pesticides according to the product label. Using a pesticide in a manner other than that specified by the label is illegal.

13. It is recommended that indoor spraying applications in office locations occur during the period of lowest occupancy.

a. For example, areas inhabited only during the weekday day shift should be treated only after the end of normal work hours on Friday.

b. Use only pesticides that have been approved for use in Duke Energy
Safety Signs

1. Make safety signs readily visible at all times when a hazard exists; promptly remove (or cover) when the hazard no longer exists.

2. Use safety signs that can withstand the environment.

3. Use red “Danger” tape to warn of immediate hazards. Locate tape at such distance from the hazard that persons cannot accidentally come into contact with the hazard.

4. Use yellow “Caution” tape to designate potential hazard areas. Locate tape so as to restrict access into the area.

5. When using warning tape if the hazard is not obvious, add specific information about the hazard and the name of a contact person.

6. When working within a posted area, use the personal protective equipment necessary to avoid injury.

7. Neatly install the ribbon/tape and keep it intact as long as the hazard exists.

8. Promptly remove the ribbon/tape when the condition is corrected.

9. Do not use ribbon/tape as a barrier to prevent a fall or in place of a required guardrail. If ribbon/tape is used to warn of a floor opening or hole, ensure a person is continuously stationed at the opening to prevent accidental entry.

10. In switchyards, use red danger tape to designate energized areas next to work areas. Attach red tape or red flags to designate safe heights on structures, columns, or poles above which workers may not climb because of energized equipment or circuits.
Scaffolds

1. Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift and after any occurrence which could affect the scaffold’s structural integrity.

2. Pay attention to footing, planking, guardrails, mesh, connections, weld, rust, ladder or other access means.

3. Use personal fall arrest equipment on supported scaffold platforms higher than 6 ft. if guardrails are not installed.

4. Use personal fall arrest equipment and a guardrail system on single-point and two-point adjustable suspension scaffolds.

5. Use personal fall arrest equipment on Boatswain’s chairs, catenary scaffolds, float scaffolds, needle beam scaffolds and ladder jack scaffolds.

6. Where tools, materials, or equipment falling from a scaffold could strike workers below, do one or more of the following:
   a. Install a toe board.
   b. Mark the area below with caution tape or install barricades to prohibit workers from entering.
   c. If materials are piled higher than the toe board, use a screen around the perimeter of the scaffold.

7. Do not use a defective scaffold. Ensure a WARNING, DO NOT USE tag is put on a faulty scaffold until it is repaired.

8. Use the access provided with the scaffold.

9. Do not accumulate too many tools, materials, and debris on the scaffold or overload it beyond the rated capacity.

10. Do not stand on or lay tools, materials, and equipment on any scaffold railing.

11. To prevent tipping, do not load a scaffold unevenly.
12. During high winds and storms, do not work on an outside scaffold.
13. Do not work on an ice-coated scaffold.
14. Ensure mobile scaffolds rest on a solid level footing.
15. If wheels or casters are provided, lock them to prevent accidental movement on scaffolds.
16. When asked to move mobile scaffolds:
   a. Get help so the pressure of pushing is not concentrated in one point on the scaffold.
   b. Ensure scaffold will move across level floors that are also free of obstructions and openings.
   c. Apply force close to (5 ft. or less) the base of the scaffold.
17. Workers may “ride” a mobile scaffold if all of the following conditions are met:
   a. The floor or surface the scaffold will travel on must be within 3 degrees of level and free of obstructions and openings and.
   b. The minimum dimension of the base of the scaffold must be at least half its height.
   c. Tools, materials, equipment, and debris must be removed before the scaffold is moved.
   d. Workers riding the scaffold know about the movement of the scaffold.
   e. Workers are not on any part of the scaffold that extends over wheels, casters, and other supports.
18. For other than mobile scaffolds, scaffolds shall not be moved horizontally while workers are on them, unless they have been designed by a registered professional engineer specifically for such movement.
20. When moving mobile scaffolding, avoid obstructions including piping equipment, instrumentation, electrical lines, etc.

21. Keep the scaffold’s working surface clean and organized at all times.

22. When the job is completed, remove all items from the scaffold.

23. Do not erect, use, dismantle, alter, or move scaffolds so that they or any conductive material handled on them comes closer to exposed and energized power lines than:
   a. 10 feet for lines under 50 KV
   b. 10 feet plus 4 inches for each 10 KV over 50 KV

24. Do not use the frame on welded tubular frame supported scaffolds to access upper levels unless the distance between the integral rungs is 16-3/4 inches or less and the rungs are uniformly spaced. Otherwise, use an extension or hook-on ladder.

25. Use tag lines or equivalent measures to control swinging loads when they are being hoisted onto or near scaffolds or if the loads could contact the scaffold.

26. Use ladders on scaffolds to increase working level height of workers only on large-area scaffolds.

27. Inspect wire ropes for defects before each work shift and after any occurrence that could affect a rope’s integrity. Replace ropes if:
   a. Any physical damage impairs the function and strength of the rope.
   b. Kinks impair the tracking or wrapping of rope around the drum(s) or sheave(s).
   c. Six randomly distributed broken wires are in one rope lay, or three broken wires are in one strand in one rope lay.
   d. Abrasion, corrosion, scrubbing, flattening, or peening causes the loss of more than 1/3 of the original diameter of the outside wires.
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e. Heat damage caused by a torch or any damage caused by contact with electrical wires is evident.

f. The secondary brake has been activated and has engaged the suspension rope during an over speed condition.

28. Ensure that wire rope clips on suspension scaffolds are inspected and retightened to the manufacturer’s specifications at the start of each work shift.

29. Ensure the wire ropes on suspension scaffolds are shielded, treated to resist corrosive substances, or made of material which is not adversely affected by the substance being used when acids and other corrosive substances are used.

30. Shield suspension ropes when performing a heat-producing process.

31. Reduce the possibility of welding current arcing through the suspension wire rope when welding is performed on suspension scaffolds by ensuring the following:

a. An insulated thimble is used to attach each suspension wire rope to its hanging support.

b. Excess suspension wire rope and any additional independent lines from grounding are insulated.

c. The suspension wire rope is covered with insulating material extending at least 4 feet above the hoist.

d. The tail line below the hoist is insulated to prevent contact between it and the platform.

e. The portion of the tail line that hangs free below the scaffold is guided and/or restrained so that it does not become grounded.

f. Each hoist is covered with insulated protective covers.

g. In addition to a work lead attachment required by the welding process, a grounding conductor is connected from the scaffold to the structure.
h. Ensure that the size of this conductor is at least the size of the welding process work lead, and this conductor is not in series with the welding process of the work piece.

i. If the scaffold grounding lead is disconnected at any time, the welding machine is shut off.

j. An active welding rod or uninsulated welding lead is not allowed to contact the scaffold or its suspension system.

References:
OSHA 1926.450, 451, 452, and 454 and Non-mandatory Appendices
Steel Erection

Fall Protection Requirements for Steel Erection Activities

Duke Energy employees shall be protected from fall hazards as described in the Fall Protection and Walking & Working Surfaces Program. For fall hazards greater than 6 feet for construction activities, employees will be protected by guardrails or wear personal fall arrest equipment.

Contractor employees involved in steel erection projects shall be protected from fall hazards as described below provided they have been trained in OSHA's Steel Erection Standard. On a project or station basis, the height level at which fall protection is required may be lowered to 6 feet if agreed to in advance and in writing by the project manager/project liaison and the contractors. Requirements in Kentucky are different and can be found at:


1. Every worker engaged in a steel erection activity who is on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level must be protected from fall hazards by guardrail systems, safety net systems, personal fall arrest systems, positioning device systems, or fall restraint systems. Exceptions: See items 2 and 3 for connectors and for work in controlled decking zones.

2. Connectors must be protected from fall hazards of more than 2 stories or 30 feet above a lower level, whichever is less, by guardrail systems, safety net systems, personal fall arrest systems, positioning device systems, or fall restraint systems. Connectors must also:
   a. Have completed connector training in accordance with OSHA.
   b. Be provided, at heights over 15 and up to 30 feet above a lower level, with a personal fall arrest system, positioning device system, or fall restraint system. Unless guardrails are provided, connectors must wear a harness between 15 and 30 feet but they are not required to attach it to an anchorage point until they get to heights exceeding 30 feet.
3. A Controlled Decking Zone (CDZ) may be established in that area of the structure over 15 and up to 30 feet above a lower level where metal decking is initially being installed and forms the leading edge of a work area. In each CDZ, the following must apply:

   a. Each worker working at the leading edge in a CDZ must be protected from fall hazards of more than 2 stories or 30 feet, whichever is less.

   b. Access to a CDZ must be limited to only those workers engaged in leading edge work.

   c. The boundaries of a CDZ must be designated and clearly marked. The CDZ must not be more than 90 feet wide and 90 feet deep from any leading edge. The CDZ must be marked by the use of control lines or the equivalent. Examples of acceptable procedures for demarcating CDZs can be found in OSHA 1926.750, Appendix D at www.osha.gov.

   d. Each worker working in a CDZ must have completed CDZ training in accordance with “Special Training Programs” in OSHA 1926.761 at www.osha.gov.

   e. Unsecured decking in a CDZ must not exceed 3,000 square feet.

   f. Safety deck attachments must be performed in the CDZ from the leading edge back to the control line and must have at least 2 attachments for each metal decking panel.

   g. Final deck attachments and installation of shear connectors must not be performed in the CDZ.

References:
OSHA 1926.750-761
Kentucky regulation on steel erection 803.KAR 2:417
Thermal Safe Work Practices

General

1. Dress appropriately for the environmental conditions.
2. Effectively plan, engineer, and schedule work/projects to eliminate, control, or minimize exposure to temperature extremes.
3. Take adequate breaks and replace fluids frequently.
4. Maintain good physical condition to minimize and/or eliminate injuries/illnesses from exposure to heat or cold.
5. When working in adverse weather conditions (e.g., snow/ice storms), take appropriate precautions.
6. Wherever possible, utilize the buddy system if you must travel or work outdoors in dangerous conditions.

Heat

1. When working (or preparing to work) in areas of extreme heat, consume adequate and appropriate amounts of fluids to help avoid heat-related illnesses and dehydration. (Drink water often, about every 15 minutes; avoid carbonated drinks and those that contain caffeine.)
2. Adequately replace salt and other minerals through normal diet. (Supplements are usually unnecessary.)
3. Plan work based on recommended stay times. Provide adequate personnel for rotation.
4. Slowly build up a tolerance for heat exposure. Where appropriate, reduce stay time accordingly.
5. When working in hot environments, wear appropriate clothing. Use ice vests if desired.
6. Take precautions to protect from overexposure to the sun (e.g.,
Safe Work Practices

clothing, eye protection, sun screen).

7. Permit employees to interrupt their work if experiencing signs of heat-related disorders or extreme discomfort.

Cold

1. When working in cold environments, dress to stay warm and dry. Use rain gear, layered, or insulated clothing as appropriate.

2. Observe coworkers for symptoms of frostbite and hypothermia. When necessary, use warming shelters or vehicle cabs for temporary relief. Seek medical attention when appropriate.

3. Walk carefully on snowy and icy surfaces.

4. When shoveling snow, be very careful to avoid overexertion.

5. Soaking wet clothing contributes to hypothermia and should be removed as soon as possible.

6. Use of vibrating tools in extremely cold weather could aggravate a circulatory condition called Raynaud’s Syndrome and should be avoided by affected individuals.
Trenching and Excavations

1. Prior to digging any trench or excavation, ensure that all underground utilities are located.

2. No worker shall enter a trench or excavation deeper than 5 feet unless it has been inspected by a competent person.

3. Each worker in an excavation shall be protected from cave-in by an adequate protective system to consist of either sloping, shielding, or shoring except when:
   a. Excavations are made entirely in stable rock; or
   b. Excavations are less than 5 feet in depth and there is no potential for cave-in.

4. A competent person shall select the protective systems for trenches less than 20 feet deep. A registered professional engineer shall select protective systems for excavations over 20 feet in depth.

5. For trenches deeper than 4 feet, provide a stairway, ladder or ramp and locate it so that no more than 25 feet of lateral travel is required to access.

6. Workers who are exposed to vehicular traffic must wear high visibility vests or other garments.

7. Workers shall not work under loads handled by lifting or digging equipment.

8. A warning system must be utilized when mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have clear and direct view of the edge.

9. Atmospheric testing is required where oxygen deficiency (less than 19.5 percent oxygen) or a hazardous atmosphere could exist.

10. When ventilation is used to reduce the level of atmospheric contaminants to an acceptable level, testing must be conducted as
often as necessary to ensure continuing safety.

11. Emergency rescue equipment must be readily available where hazardous atmospheric conditions exist or can reasonably be expected to develop.

12. Workers must be protected when working in excavations where water has accumulated or is accumulating.

13. Daily inspections of excavations, adjacent areas, and protective systems must be made by a competent person for evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions.

14. If evidence of a possible cave-in, failure in the protective system, hazardous atmosphere, or other significant concerns are found, all affected workers must be removed from the hazardous exposure until rendered safe.

15. Inspections shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when worker exposure can be reasonably anticipated.

16. To keep soil piles from falling into the trench, clear edges of excavations back to at least 2 feet.

17. Provide walkways where workers or equipment are permitted to cross over excavations. Use guardrails where walkways are 6 feet or more above lower levels.

18. Barricade open, unattended excavations.

References:
OSHA 1926.650
Uncontrolled Hazardous Waste Site Cleanup

1. All employees and/or contractors must review and be familiar with the site Health and Safety Plan.

2. An exclusion zone must be clearly marked. Non-qualified personnel are not allowed past the exclusion zone.
   a. Do not enter the exclusion zone of the site unless the appropriate level of training qualifications has been met for the work to be performed.

3. Use proper respiratory personal protective equipment (PPE) appropriate to the work performed.

4. Personnel using respirators must be qualified for each type of respiratory protection used (e.g. air purifying, self-contained breathing apparatus-SCBA).

5. Consult the site Health and Safety Plan for details on additional PPE to be used for various work activities.

6. In dangerous areas of the site, a “buddy system” must be in place to ensure a safe rescue can be accomplished.
   a. In a buddy system
      i. Two employees keep an eye on each other.
      ii. Only one enters the dangerous area at a time while the other maintains a safe distance.
      iii. Both should be wearing an equal level of PPE and respiratory protection.

7. Since new hazards may be uncovered during work activities, all personnel must maintain awareness of changes in the site.

8. Follow proper procedures for identified safety hazards including:
   a. Confined space entry
   b. Trenching work
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c. Lockout/Tagout
d. Fall protection

9. Participate in air monitoring operations conducted by the designated site Safety and Health Officer.

10. Follow specific sections of the (Health and Safety Plan) HASP consistently:
   a. Personal and equipment decontamination procedures
   b. Roles/responses in case of an emergency at the site.
   c. Site procedures for handling and labeling drums, where applicable

11. Report any health and safety concerns or newly identified hazards to site supervision and to the site Safety and Health Officer.

12. Injuries and illnesses that are believed to be related to exposure to hazards at the site must be reported to site supervision and to the site Safety and Health Officer.
Vegetation Management

General

Vegetation management contractors shall comply with applicable OSHA standards and with ANSI Z133.1, Safety Requirements for Arboricultural Operations. In addition, this section applies.

Every worker is responsible for his or her own safety while on the jobsite and shall comply with all requirements.

Job Briefing

1. Job briefings are required to be performed at the start or resumption of each work activity.

2. The supervisor, crew leader, or employee-in-charge shall hold a job briefing to review work procedures, hazards associated with the job, special precautions, energy source controls, and personal protective equipment.

3. It is the responsibility of the person in charge to conduct these briefings:
   a. At the beginning of work shifts.
   b. At the start of the job.
   c. After a job has been interrupted for any reason.
   d. When personnel are added to or removed from the job.
   e. When any conditions change that could affect employee safety.

4. The job briefing shall include discussion of the following items among others:
   a. Personal protective equipment required for the job including head, eye, face, foot, hearing, hand, respiratory, and chain saw resistant leg protection.
   b. Communication systems to be used (verbal, hand signals,
The Drop Zone

1. The drop zone must be identified and secured. If necessary, the drop zone shall be marked by the use of suitable signs, cones and/or barriers.
   a. The drop zone is defined as the area on the ground directly under tree limbs being cut and adjacent areas where falling limbs could land as the result of being deflected off trees or structures.
2. Workers overhead shall visually check the drop zone prior to making the first cut.
3. Ground staff shall inform arborists/line workers aloft before entering the drop zone under the tree or operating noisy machinery such as chainsaws and brush chippers which could hinder communication.

Communications

1. Communications among arborists/line workers aloft and other workers on the ground shall be established before cutting and dropping limbs. The command “stand clear” from aloft and the response “all clear” from the ground are terms that may be used for this purpose. Pre-arranged two-way hand signals may also be used. Arborists and other workers returning to the work area shall be acknowledged by arborists aloft.
2. All verbal communications between ground personnel and the arborist/line worker aloft requires repeat-back.
Water Safety

Working Over or Near Water

1. When working over or near water, where the danger of drowning exists, wear U.S. Coast Guard-approved personal flotation devices. Inspect before and after each use.

2. When fall protection will prevent persons from falling into water, personal flotation device is not required.

3. For construction activities:
   a. Ensure a life ring with 90 ft. of line is readily available and that travel distance between the life rings does not exceed 200 ft.
   b. On open waterways, ensure at least one boat is immediately available at the job location.

Water Crafts

1. Ensure operators have demonstrated skills and/or training to operate water craft safely. Contact the U.S. Coast Guard for boating safety training resources.

2. Ensure all water craft meet U.S. Coast Guard requirements.

3. When in a water craft, wear Coast Guard-approved personal flotation devices.

4. Ensure watercraft longer than 16 ft. is equipped with a Coast Guard-approved throwable personal flotation device.

5. When the atmospheric and/or water temperatures are less than 50 F, wear hypothermic protection. Note: Hypothermic protection is not required when the temperature is less than 50° F for short duration jobs (5 minutes or less) where workers are in visual contact with coworkers on shore. Routine cold weather apparel provides sufficient protection for short exposure time.
6. Inspect personal flotation devices and float coats before and after each use.

7. Use the engine-kill switch on any water craft so equipped.

8. Wear eye protection to protect from UV rays and/or flying debris.

9. When conditions warrant, wear proper clothing, and/or use sun block.

10. Before operating water craft, evaluate weather conditions. Do not perform work in unsafe conditions (e.g., lightning, high wind, low visibility).

11. Communicate a float plan before departure.

12. Ensure watercraft has a means of communication with a land-based contact.

13. Business units shall develop aquatic search and rescue plans as appropriate.

**Barges**

_The following applies to barges used for maintenance and construction around dams and generating plants. It does not apply to coal barges._

1. When working on a barge, wear U.S. Coast Guard-approved Type I, II, III, or V personal flotation devices. Inspect personal flotation device before and after each use. Note: Personal flotation devices must be available but are not required to be worn on structural barges with substantial guardrails.

2. Ensure availability of a Coast Guard-approved 30 in. life ring with 90 ft. of line and at least one permanent ladder that will reach the surface of the water from the top of the barge.

3. When combustible materials are present, ensure fire extinguishers are readily available.

4. Ensure safe access/egress to/from barge.

5. Ensure handrails are installed unless their presence is a more
significant safety hazard.

6. Ensure all barge connections are in place before operation (e.g., barge-to-barge, spud wells-to-barge, and anchorage).

7. Ensure engineering has approved all barge modifications.

8. Designate and maintain unobstructed walkways/aisles at all times.

9. Use and maintain anti-skid material on walking/working surfaces.

10. Safely secure all material/equipment to the barge deck.

11. Ensure operators of equipment (e.g., cranes, drills) are familiar with the equipment and can demonstrate the skills necessary to safely operate it from an unstable platform (e.g., barges, dredges).

**Diving Operations**

For diving requirements, see OSHA 29CFR 1910.401, Subpart T; Commercial Diving Operations.
Waterborne Pathogens

Personal protective measures

1. Wash hands and face when leaving the work area.

2. Where full body contact with contaminated water has occurred (e.g. soaked by contaminated cooling tower mists), a shower using soap is recommended. The shower should have an effective drain system to ensure that contaminated water is removed from the area. Decontamination of the shower with a disinfectant is recommended to ensure that the shower area does not become contaminated.

3. Refrain from touching your nose, mouth, eyes, or ears with your hands, unless you have just washed.

4. Personnel with open wounds or sores must cover these areas with water-proof bandages. If not feasible, these personnel shall not enter the contaminated area.

5. Do not eat, drink or smoke in the work area.

6. Contact the site health and safety representative for specific information regarding the level and type of respiratory protection needed. In most situations, wearing a full-face, negative pressure respirator equipped with P-100 (HEPA) cartridges can provide adequate respiratory protection from waterborne pathogens.

   a. Where water saturation of the respirator filter from visible airborne mists is a concern (e.g., during tube cleaning with high-pressure water), use one of the following options
      
      i. Use a supplied air respirator
      ii. Use a water vapor pre-filter in addition to the particle filter, if available
      iii. Decrease the change out schedule time for the filter cartridge after consultation with the site health and safety representative.
7. At a minimum, work gloves and regular clothing must be worn. If immersion of hands in the contaminated water is likely to occur, use waterproof gloves (e.g. nitrile).

8. If liquid contact is anticipated, wear the following:
   a. Rainsuit or Tyvek overalls
   b. Rubber boots
   c. If not using a full face respirator, use a face shield and safety glasses.

9. Upon leaving the work area, contaminated protective clothing and equipment should be removed and bagged for disposal and/or disinfection.

10. Report any illness believed to be related to work with waterborne pathogens.

11. Offer tetanus and diphtheria shots for employees who work with sewage. Note: According to the Center for Disease Control, workers exposed to sewage are not at increased risks for contracting Hepatitis A, B, or the human immunodeficiency virus.

**Protective Measures for Work During/After Floods**

Some Duke Energy employees (e.g. Power Delivery and Gas Operations) may be required to work in an area during or immediately after a flood. Floodwater can be contaminated with microorganisms, sewage, industrial waste, chemicals, and other substances that can cause illness or death.

The following safe work practices apply in these situations:

1. Wear protective gloves when:
   a. Working in contaminated floodwaters
   b. Handling contaminated objects
   c. Handling animal remains.

2. Gloves should be heavy, cut-resistant, made of waterproof material
Safe Work Practices

(nitrile or similar washable material).

3. Wash hands with soap and clean water or hand sanitizer:
   a. After cleanup or decontamination work
   b. Before preparing or eating food
   c. Before smoking, chewing gum or tobacco
   d. After toilet use.

4. Avoid touching your face with contaminated gloves.

5. Wound care
   a. Wash wounds with soap and clean water or a hand sanitizer immediately.
   b. Seek immediate medical attention if wound becomes red, swollen, or oozes pus.

Disinfecting water (when clean water not available)

In most situations, clean soap and water should be available for Duke Energy crews. If not, water can be disinfected for hand washing or tool/equipment decontamination by using the following procedure:

1. Mix 1/4 teaspoon of household bleach per 1 gallon of contaminated water.
2. Let bleach-water mixture stand for 30 minutes.
3. Label containers (e.g., “bleach disinfected water – DO NOT DRINK”).
4. Prepare fresh solutions daily, preferably just before use.
5. For equipment/tool decontamination, immerse in the solution for 10 minutes.
6. Avoid getting bleach on flame resistant (FR) clothing.
Welding and Thermal Cutting Work Practices

1. Do not clean with compressed air. Use HEPA vacuums or other means that do not disperse dust into the air.

2. Do not take contaminated protective clothing or equipment home.

3. Do not enter eating/drinking area with work clothing unless dust has been removed (in a manner that does not disperse dust into the air).

4. Do not smoke, eat, drink or chew gum or tobacco products in welding or thermal cutting work areas. See supervision about where these activities are allowed.

5. Whether working in the weld shop or in the field, position yourself so that your breathing zone is not in the fume plume, regardless of the relative hazard of the process. If work conditions prevent proper positioning, use ventilation to direct fumes away from welders, cutters and helpers.

6. Be sure other workers (other welders, helpers) in the area or above the area are not working in the fume plume.

7. For welding jobs in shops, use local exhaust ventilation.

8. When using welding screens around your work, arrange screens so that restrictions to ventilation are minimized.

9. Position the exhaust system take-off near enough to the electrode to ensure maximum fume capture, but not too near to disturb weld quality, when using local exhaust ventilation.

10. Do not use oxygen for ventilation purposes.

11. Where ventilation or natural conditions do not control welding/cutting fumes from reaching the workers’ breathing zones, use appropriate respirators.

12. When possible, remove all coatings by chemical or mechanical means (with local exhaust ventilation) prior to thermal cutting. Remove a “cut line” of at least a width of 3” to 4”. If coating removal
is not possible, use ventilation and/or respiratory protection.

13. Prior to removing or disposing of coating materials, determine if the coating contains lead or hexavalent chromium. See your location EHS professional for guidance.

14. Before applying heat, verify that metal is clean of any solvents (particularly chlorinated solvents), oils or other materials that may cause hazardous decomposition products.

15. Do not perform welding or thermal cutting activities within 200 feet of the storage of chlorinated solvents.

16. Discuss potential fume hazards in the pre-job brief. Review product MSDS and/or hazard label, ventilation options and PPE. Coordinate with location Safety and Health to determine if adequate exposure assessments have been completed for the specific activity.