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Rocco.D'Ascenzo@duke-energy.com
Rocco O. D'Ascenzo
Associate General Counsel

VIA COURIER SAME DAY DELIVERY

October 31, 2016

Ms. Talina Rose Matthews
Executive Director
Kentucky Public Service Commission
211 Sower Blvd
Frankfort, KY 40602-0615

Re: Case No. 2016-00349
In the Matter of Duke Energy Kentucky, Inc. Alleged Failure to Comply with KRS 278.042

Dear Ms. Matthews:

Duke Energy Kentucky, Inc. hereby submits the *Response of Duke Energy Kentucky, Inc. and Motion to Suspend Hearing and Schedule an Informal Conference* pursuant to the Commission's October 11, 2016 Order. The original and twelve (12) paper copies have been enclosed.

Please date-stamp and return two extra copies of the response in the enclosed return-addressed envelope.

Respectfully submitted,

Rocco D'Ascenzo (92796)
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Counsel for Duke Energy Kentucky, Inc.

cc: Rebecca W. Goodman (w/enclosure)

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:	)	
	)	
DUKE ENERGY KENTUCKY, INC.	)	**CASE NO. 2016-00349**
	)	
	)	
ALLEGED FAILURE TO COMPLY WITH KRS 278.042	)	
	)	

RECEIVED
OCT 31 2016
PUBLIC SERVICE COMMISSION

RESPONSE OF DUKE ENERGY KENTUCKY, INC. AND MOTION TO SUSPEND THE HEARING AND SCHEDULE AN INFORMAL CONFERENCE

On October 11, 2016, the Kentucky Public Service Commission (Commission) issued an Order directing Duke Energy Kentucky, Inc., (Duke Energy Kentucky) to file a written response to the allegations contained in the Accident Investigation Staff Report (Staff Report) prepared by the Commission Staff and dated November 23, 2015. For its Response to the Commission's Order, Duke Energy Kentucky states as follows:

1. Duke Energy Kentucky admits that the information contained on page 2 of the Report, consisting of the section titled "Accident Description" is accurate.

2. With regard to the information contained on page 3 of the Report, which is a continuation of the "Accident Description," Duke Energy Kentucky admits that the first, second, third and fourth paragraphs are accurate.

3. With regard to information contained on page 4 of the Report, that comprises a continuation of the "Accident Description" and describes the contents of the NESC and Duke Energy's Safety Manual, Duke Energy Kentucky admits that the first, second, third and fourth paragraphs are accurate.

4. With regard to information contained on page 4 of the Report titled "Findings," Duke Energy Kentucky denies that it committed a willful violation of Kentucky Revised Statutes (KRS) 278.042, Commission Regulations, the National Electric Safety Code (NESC) or the Safety Manual.

5. With regard to the information contained in the section of the Report beginning on page 4 titled "Relevant Codes, Statutes, Regulations, or Safety Manual Issues that Are Pertinent to the Investigation," and continuing through page 17, Duke Energy Kentucky admits the regulations, code sections, statutes, and safety manual sections are accurately stated.

6. With regard to Attachment A to the Report, Duke Energy Kentucky admits that it is an accurate copy of the Utility Summary Report submitted by Duke Energy Kentucky on April 10, 2015. Duke Energy Kentucky admits that the photographs contained in Attachment A to the Report are accurate, but denies that said information establishes a willful violation of KRS 278.042, Commission Regulations, the NESC or the Safety Manual.

7. With regard to Attachment B to the Report, Duke Energy Kentucky admits that it is an accurate copy of Additional Information provided by Duke Energy Kentucky, but denies that said information establishes a willful violation of KRS 278.042, Commission Regulations, the NESC or the Safety Manual.

8. With regard to Attachment C to the Report, Duke Energy Kentucky admits that is a true and accurate copy of the Utility Accident Report provided on October 9, 2015, but denies that said information establishes a willful violation of KRS 278.042, Commission Regulations, the NESC or the Safety Manual.

RESPONSE TO ALLEGATIONS OF VIOLATIONS

9. With regard to 15 numerical alleged violations of KRS 278.042, Commission Regulations, the NESC and Duke Energy's Safety Manual, Duke Energy Kentucky states that it is in full compliance with applicable law.

10. With regard to alleged violation 1) NESC Part 4, Section 42, Rule 420.D requiring, among other things, that employees consider electric supply equipment and lines to be energized unless they are positively known to be de-energized, Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

11. With regard to alleged violation 2) NESC Part 4, Section 42, Rule 420.H-1 requiring, among other things, that employees "shall use personal protective equipment, the protective devices, and the special tools provided for their work," Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

12. With regard to alleged violation 3), NESC Part 4, Section 42, Rule 421.A.1-2, requiring, among other things, that first level supervisors or person in charge "adopt precautions within that individuals' authority to prevent accidents," Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

13. With regard to alleged violation 4) NESC Part 4, Section 42, Rule 421.A.6, requiring, among other things, that the first level supervisor or person in charge "shall conduct a job briefing with the employees involved before beginning each job," Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility. While the former employee did perform an initial job briefing, a second or updated job briefing did not occur, as was required under Company protocol when the scope of work changed.

14. With regard to alleged violation 5) NESC Part 4, Section 42, Rule 421.B.2, requiring, among other things, that "when working on one section where there is a multiplicity of sections, such as one panel of a switchboard, one compartment of several, or one portion

of a substation, employees shall mark the work area conspicuously and place barriers to prevent accidental contact with energized parts in that section or adjacent sections," Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

15. With regard to alleged violation 6) NESC Part 4, Section 44, Rule 441.A.1 and 3, requiring, among other things, that "employees shall not approach or bring any conductive object within the minimum approach distance...," Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

16. With regard to alleged violation 7) NESC Part 4, Section 44, Rule 442.A-C, requiring, among other things, that "a designated person shall: 1) keep informed of operating conditions affecting the safe and reliable operation of the system; 2) Maintain a suitable record showing operating changes in such conditions; 3) Issue or deny authorization for switching as required for safe and reliable operation, and further that qualified persons obtain authorization from the designated person before switching sections of circuits,"

Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. Duke Energy Kentucky states that, at all times, it did maintain such a designated person. Duke Energy Kentucky denies the allegations. The former employee was never authorized to enter the second cabinet and switching of circuits, thus did not occur.

17. With regard to alleged violation 8) NESC Part 4, Section 44, Rule 443.A and G, requiring, among other things, that "when working on energized lines and equipment, one of the following safeguards shall be applied a: insulate employee from energized parts. b. isolate or insulate the employee from ground and grounded structures, and potentials other than the one being worked on...," Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

18. With regard to alleged violation 9) NESC Part 4, Section 44, Rule 444.A-E, requiring, among other things, that specific precautionary measures be taken " [w]hen employees must depend on others to operate switches or otherwise de-energize circuits on which they are to work, or must secure special authorization before they operate such switches themselves..." Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this

provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

19. With regard to alleged violation 10) NESC Part 4, Section 44, Rule 445.A, requiring, among other things, "[e]xtreme caution shall be exercised that the proper sequence of installing and removing protective grounds is followed..." Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this provision of the NESC and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

20. With regard to alleged violation 11) Duke Energy Kentucky Safety Manual-General: requiring job briefings, Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this requirement and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility. While the former employee did perform an initial job briefing, a second or updated job

briefing did not occur, as was required under Company protocol when the scope of work changed.

21. With regard to alleged violation 12) Duke Energy Kentucky Safety Manual-Minimum Approach Distances: requiring, among other things employees to "observe MAD [minimum approach distances]..." and to not "approach or bring any conductive object closer to energized parts than the MAD..." Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this requirement and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

22. With regard to alleged violation 13) Duke Energy Kentucky Safety Manual-General Electric Safety: requiring, among other things employees to "consider all existing lines and equipment energized, including conductors on the ground, until they have been tested for voltage with an approved test device, tagged as required according to switching and tagging procedures and then grounded," Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this requirement and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

23. With regard to alleged violation 14) Duke Energy Kentucky Safety Manual-Rubber Gloves and Rubber Sleeves: requiring, among other things that "Class 2 or greater rubber gloves with leather glove protectors must be worn when working on or within the MAD of energized conductor or equipment up to 17-kv phase to-ground," Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this requirement and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

24. With regard to alleged violation 15) Duke Energy Kentucky Safety Manual-Grounding Distribution Lines: requiring, among other things that "lines and equipment must be considered energized until they have been isolated from all voltage sources by means of visible open points, tested for voltage with an approved voltage detector and properly grounded" Duke Energy Kentucky states that it adheres to this standard and maintains policies, procedures and training for its employees consistent with this requirement and expects and requires its employees to follow such training, policies and standard at all times. While Duke Energy Kentucky concedes that in this instance, its former employee failed to abide by such standards, such action was a result of that employee failing to follow Company protocols and not by the willful action of the utility.

AFFIRMATIVE DEFENSES

25. Duke Energy Kentucky states that the Company maintains policies and procedures through its Health and Safety Handbook that are consistent with relevant portions of the NESC and that are designed to protect its employees. Exhibit 1 is a copy of the 2016 Health and Safety Handbook and summary of changes.

26. Following the incident described in the Report, Duke Energy Kentucky took action to reinforce safety expectations among all transmission and distribution construction and maintenance employees and discussed this incident among all supervisors for communication among all electric transmission and distribution construction and maintenance employees. Additionally, due to the actions of the supervising person involved and causing the incident described in the report, that person is no longer employed by the Company.

27. Duke Energy Kentucky states that the former supervising employee involved in the incident had been with the Company for approximately seven years, and had received regular training regarding various safety and work practices including, but not limited to, specific training in Personal Protective Grounding in Substations less than three months before the incident. Exhibit 2 contains a copy of the training transcript of the former employee whose actions are described in the Report.

28. Effective in 2016, Duke Energy Kentucky developed and implemented a focused campaign to review 21 work practices related to electrical safety for transmission and distribution employees, designed to improve employee safety, and prevent similar such incidents in the future

29. Duke Energy Kentucky notes that KRS 278.990 authorizes the assessment of penalties only when a person willfully violates a Commission statute or regulation or fails to obey a Commission Order. In this case, the Company denies that it willfully violated a Commission statute, or regulation, or failed to obey a Commission Order.

NOW, THEREFORE, Duke Energy Kentucky requests that the case be dismissed, or in the alternative, moves that the hearing date of December 8, 2016 be suspended and an informal conference be scheduled with the Commission Staff for the purpose of discussing settlement and expediting resolution of this proceeding. Duke Energy Kentucky's willingness to discuss settlement is not, and should not be construed as, an admission of liability on its part.

Respectfully submitted,

DUKE ENERGY KENTUCKY, INC.

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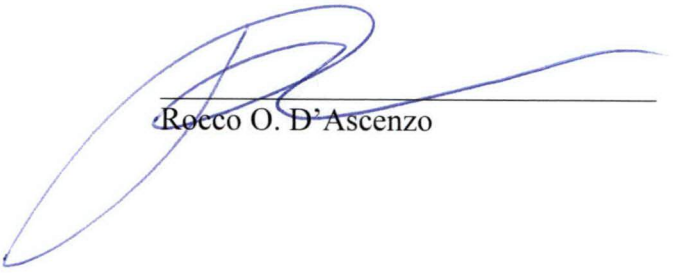
CERTIFICATE OF SERVICE

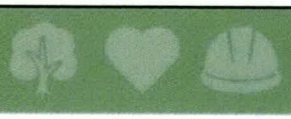
This is to certify that a copy of the foregoing Response has been served via overnight delivery to the following party on this 31st day of October, 2016.

Office of the Attorney General
Rebecca W. Goodman
1024 Capital Center Drive, Suite 200
Frankfort, Kentucky 40601



Rocco O. D'Ascenzo

2016 H&S Handbook - Key Content Changes At-A-Glance



Environmental, Health and Safety

Section	Page	What's Changed	Type of Change
Employees' Responsibilities	4	Requirement to report incidents was clarified to indicate that they be reported "immediately to supervision"	Clarification
Employees' Responsibilities	4	New bulleted item. Employees are to participate actively in job briefings to ensure they are fully aware of hazards.	Operational experience
Aerial Lifts	9	Revised item 3. Rearranged the text related to use of tag lines when lifting loads. Clarification only.	Editorial
Avoiding Illness from Insects and Ticks	12	New section. Provides guidance on avoiding illness from insect, spiders, yellow jackets, and ticks.	Best practice Risk Reduction
Dropped Object Prevention in Fossil Generating Stations	28	New item 5. Additional guidance on preventing dropping tools and equipment. This information is currently in the FHO Dropped Object Prevention and is not a new requirement.	Best practice Risk Reduction
Electrical Safety in T&D and Metering	32	Revised item 5. Clarified expectations for air testing rubber gloves. Changed from "before use" to "before each day's use". Also added expectation to air test gloves immediately after any incident that is suspected of causing damage.	Clarification
Electrical Safety in T&D and Metering	49	New item – Ground Fault Protection for Personnel. Identifies when GFCI is required.	Best practice Risk Reduction
Handling Hazardous Chemicals/ Substances	89	Revised item 5b. Clarified that this item applies only to acids and caustics. Deleted reference to "other chemicals" which was determined to be too broad.	Clarification
Heat and Cold Exposure	95	New item 15. Added hydration target table for employees working in hot environments to assist in avoiding heat related illness. Provides recommended quantity and frequency for drinking water.	Best practice Risk Reduction
Motor Vehicle Operations	107	New item 8. Expanding the requirement for hands free cellphone use across the enterprise. More than 50% of the company already requires hands free cellphone. Intended to mitigate the hazards of distracted driving.	Best practice Risk Reduction
Motor Vehicle Operations	108	New work practices related to motor vehicle operations. Item 6 – passengers are to ride in approved riding positions and wear restraints where provided. Item 7 – lock unattended vehicles to reduce risk of vehicle theft.	Best practice
Motor Vehicle Operations	108	Backing and chocking, new item 2. When backing a vehicle, if a second person is available, that person should assist the driver in backing.	Best practice
Preventing Slips, Trips, and Falls on Same Level	119	Item 1h – replaced "Blackberry's" with "other mobile devices" in requirement to avoid multitasking while walking.	Editorial
Tools	133	Chain saws, revised item 3. Added clarification that chaps not required for pole saws.	Clarification
Transmission Substation/ Switchyard Entry Requirements	135	New section. Outlines requirements for entry into Transmission substations and switchyards.	New policy

Health and Safety Handbook 2016

DUKE ENERGY®

SAFETYFirst

2016 Health and Safety Handbook

Health and Safety Vision

A healthy and injury-free workplace, sustained by behaviors that consistently demonstrate our commitment to the welfare of each other, our contractors and the communities we serve.

Safety Excellence Model

The Safety Excellence Model defines the components that are required to achieve a zero-injury, zero-illness culture. These are health and safety leadership, safety and business processes, and employee and contractor involvement. Our vision will only be achieved when these components are successful.

Employees' Responsibilities for Safety

It takes all of us to be engaged in safety for every task, every day. Engaged employees will:

- Follow the Duke Energy Safety Principles:

  Personal Accountability

  - Be responsible for your own safety.
  - Know and follow safety rules and standards at all times – even when no one is watching.

  Active Caring

  - Observe, stop and coach co-workers who are not in compliance or who exhibit at-risk behaviors.
  - Take action to assure the safety of others, and be willing to accept advice.

  Hazard Recognition

  - Be aware of your surroundings at all times.
  - Take time to actively seek out and mitigate hazards.
- Participate actively in safety improvement efforts.

- Report immediately to supervision incidents and near misses of all types including minor injuries and first aid cases.
- Be fit for duty and capable to perform the task at hand.
- Participate actively in job briefings. Be fully aware of hazards associated with the job, work procedures involved, special precautions, energy source controls, chemical exposures, and personal protective equipment requirements.

Keys to Life

The Health and Safety Handbook supports the Keys to Life. The Keys to Life highlights hazards of high-risk activities that can cause fatalities. The Health and Safety Handbook, business unit procedures and other documents define the behaviors required for these high-risk activities.

Table of Contents

Abrasive Blasting/Spray Coating

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. Refer to manufacturer's instructions.
2. Frequently check exhaust ventilation filters. Replace per manufacturer's instructions.
3. Assure 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 buildup of static electricity, assure blast hose is grounded to the pot.
8. Assure blast equipment is maintained by qualified personnel familiar with the hazards.
9. Use the following personal protective equipment (PPE): 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 H&S Manual where exposure to lead is an issue. Check with your environmental professional for disposal guidance.

Spray Coatings

1. Be familiar with the Safety Data Sheet (SDS) for spray coating materials.
2. Assure 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. Follow 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. Assure airless spray guns that atomize paints and fluids at high pressures (1,000 pounds or more per square inch) 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 and solvent-resistant gloves.

Aerial Lifts (Bucket Trucks and Digger Derricks)

1. Workers shall be trained prior to operating aerial lifts.
2. Workers shall conduct pre-flight inspection.
3. Use tag lines. Do not guide the load by pulling on the rigging.
4. Loads shall not be moved over personnel, and workers shall not walk under a suspended load.
5. Booms and attachments shall not be loaded beyond manufacturer's recommendations. This includes vertical and horizontal loading.
6. This equipment shall be stable in accordance with manufacturer's recommendations before it is operated. Outriggers, if equipped, shall be used.
7. The area on which outriggers will be placed shall be examined to determine if it is capable of supporting the load. Where necessary, outrigger pads or cribbing shall be added to assure stability of the equipment.
8. When work is completed at any given location, the boom shall be properly racked and secured, outriggers fully retracted and wheel chocks stowed prior to moving the vehicle.
9. If the boom must be uncradled to position the vehicle on the job site to perform work, the vehicle shall be stable during positioning.
10. Level indicators, if equipped, shall be operable.
11. For additional details, see the applicable business unit work practices.

Asbestos Management

1. Personnel working in facilities must be aware of the types of materials known or suspected 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. Assure 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 high efficiency particulate air (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 asbestos containing material (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. Worker 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. Depending 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. Employees performing asbestos Class I, II or III work activities for 30 days or more per year or who are exposed above the permissible exposure limit (PEL) or excursion limit (EL) shall be included in an asbestos medical surveillance program.
13. If required to use a respirator, follow the requirements for your respiratory protection program.
14. Seal waste in leak-tight containers.
15. All ACM waste must be labeled appropriately, stored in secure ACM waste storage areas and disposed of in Duke Energy-approved landfills.

Avoiding Illness from Insects and Ticks

1. When working outside, be aware of the hazards of insects, wasps, yellow jackets and ticks.
2. Use insect repellant according to the manufacturer's instructions.
3. When working in an outside environment where ticks are likely to be present, avoid tick-related illness by:
    a. Dressing appropriately. Tuck pant legs in and wear long-sleeved shirts.
    b. Reporting tick bites to your supervisor. This aids in diagnosis of symptoms later.
    c. Remove embedded ticks. Wash area with warm soapy water.
    d. Using tick repellant. Apply DEET to skin and permethrin to clothing. Do not apply DEET to flame resistant clothing.
4. Be on the lookout for yellow jackets. Do not reach into areas where yellow jackets may be nesting.
5. Seek medical treatment if you exhibit symptoms of illness or allergic reaction to bites or stings.

Bloodborne Pathogens

1. Prevent contact with the eyes, mouth, mucous membranes and non-intact skin with blood or other potentially infectious body fluids. Follow established procedures and universal precautions to prevent contact.
2. If possible, provide assistance to injured personnel without exposing yourself to fluids that can be infected with bloodborne pathogens.
3. At a scene with bloody conditions, remain calm, place a barrier between you and the injured person, control bleeding and notify emergency personnel.
4. Do not handle bloody clothing or contact contaminated surfaces unless you are trained and use proper personal protective equipment.
5. Cleanup shall only be performed by trained and properly equipped personnel.
6. Use the prescribed engineering controls and personal protective equipment.
7. Report to supervisor any contact with potentially infectious body fluid or material.

Compressed Gas Cylinders

1. Handling and moving gas cylinders:
    a. Where removable caps are provided for valve protection, such caps shall be kept on cylinders at all times except when cylinders are in use.
    b. Do not lift cylinders by the cap.
    c. Never drop cylinders or permit them to strike against other objects.
    d. Avoid dragging or sliding cylinders.
    e. Never use cylinders as roller supports or for any purpose other than to contain the content as received.
    f. Never handle the cylinder with a lifting magnet. Slings, ropes or chains shall not be used unless provisions have been made on the cylinder for appropriate lifting devices, such as lugs.
    g. Use suitable hand trucks, fork truck roll platform or similar device with cylinder firmly secured for transporting and unloading.
    h. Open cylinder valve slowly. Point the valve opening away from you and other persons. Avoid the use of a wrench on valves equipped with hand wheels. Never hammer the valve wheel when attempting to open or close a valve.
    i. Personal protective barricading facilities shall be provided when transferring gases from one cylinder to another.
    j. Cylinder valves shall be closed before moving cylinders, when work is finished and when cylinders are empty. Before regulator is removed from the cylinder, release all pressure from the regulator.
    k. Empty cylinders shall be marked "Empty" or "MT," segregated from full cylinders and returned to the supplier with all valves closed and valve protection caps in place.
2. Storage of Gas Cylinders

a. Cylinders shall be stored in accordance with SDS or other guidance provided for a specific gas.

b. Cylinders shall not be stored near highly flammable substances.

c. Cylinders shall be kept away from radiators or other sources of heat.

d. Do not store cylinders where they could become part of an energized circuit.

e. Cylinders shall be stored in assigned places, away from elevators, stairs or gangways. Assigned storage places shall be located where cylinders will not be knocked over or damaged by passing or falling objects.

f. Cylinders shall not be stored in unventilated enclosures.

g. Compressed gas cylinders not designed to be used or stored horizontally shall be tightly secured above the midpoint in an upright position at all times except, if necessary, for short periods of time while cylinders are being moved with appropriate equipment.

h. Cylinders stored on mobile vehicles shall be secured in an upright or horizontal position and guarded to prevent any damage or movement. Regulators and gauges shall be removed from compressed gas cylinders while in transit unless designed for that purpose.

i. Cylinders shall be protected from rusting.

j. Cylinders shall be hydrostatically tested according to standards of Compressed Gas Association Inc.

k. Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials (especially oil or grease) by a minimum distance of 20 feet, or by a non-combustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

    i. Oxygen and acetylene can be stored on dolly cart with regulators attached if the cart has a fire-rated barrier separating

the cylinders. Without a fire-rated barrier, store cylinders on carts with regulators attached only if it is anticipated that they will be used within 24 hours.

3. When using compressed air for cleaning, reduce air pressure to 30 psi or less or ensure that safety nozzle is installed on the blow down device.
4. Compressed air hoses with an inside diameter exceeding ½ 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.
5. Petroleum-based products shall not be used on any equipment where oxygen passes. Keep valves, torches and regulators of oxygen and fuel gas cylinders free of oils, grease and other combustibles.

Confined Space Entry

1. All workers involved in confined space entries must be trained to perform their confined space entry duties.
2. Follow the applicable business unit or site program for the location involved.
3. Do not enter any confined space without (at minimum) authorization and a pre-entry briefing from an entry supervisor. Do not enter a confined space unless there is a business need to do so.
4. Entry into a confined space shall not be performed unless a comprehensive hazard evaluation has been completed and the applicable site operating experience has been reviewed for the confined space including lockout/tagout isolation.
5. Prior to entry into a permit-required confined space:
    a. Entry supervisor shall be designated to oversee entry and shall fulfill Duke Energy's duty to reduce any serious hazard to the extent feasible or eliminate it.
    b. Entry supervisor shall complete and sign an entry permit to authorize entry.
    c. Rescue shall be pre-planned and rescue equipment shall be put in place.
6. Contractors and subcontractors may use their company program if approved in advance by Duke Energy representative.

Cranes and Rigging

General

1. Workers shall be trained and qualified prior to operating cranes. In addition, after November 2017 certain mobile crane operators will be required to be certified.
2. Workers shall operate equipment and conduct pre-operational inspections according to the operator's manual.
3. All cranes and hoists will be inspected by the operator prior to the operation of the equipment.
4. All lifts require planning. A pre-lift planning session and job briefing shall be held for all personnel involved with the lift.
    a. Load weight, size and distance shall be determined to assure that the proper equipment is available to make the lift safely.
    b. Riggers and equipment operators shall determine the weight of the load to be handled and the capacity of handling devices before moving the load.
    c. Lifting plans must be documented as described in the H&S Manual Crane and Rigging Program.
5. Outriggers shall be extended according to the manufacturer's load charts.
6. Cribbing shall be used as needed to level the crane and assure stability based on soil class.
7. Crane setup location shall be established to assure safe lifting capabilities and avoidance of obstacles.
8. Loads shall be guided by tag lines and not by pulling on the rigging.
9. Tag lines shall be of sufficient length that will allow for proper control without placing worker under the load.

10. When extending or retracting the manual fly section (dead section), the operator shall assure that it is properly pinned in place.
11. Drivers and/or operators of mobile cranes and trucks shall assure that aerial ladders, lifts, booms, pole derricks, automatic lift gates and outriggers are in the proper position for work or travel.
12. When work is completed at any given location, the boom shall be lowered, retracted and secured and outriggers fully retracted before moving.

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

1. 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 workers to hoisted loads shall be used.
2. While the operator is not moving a suspended load, no worker shall be within the fall zone, except for workers:
    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 workers 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. Workers shall be trained and qualified prior to conducting rigging and/or flagging.
2. 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. All rigging shall be inspected prior to use.
3. The rigger shall inform the flagger that the load is ready to lift.
4. The flagger is responsible for ensuring that the load is rigged satisfactorily, either by personal inspection or by verification with the rigger.
5. The flagger is responsible for directing the lift operation and communication with the lift equipment operator.
6. The flagger should wear a reflective vest and/or reflective gloves.
7. Flaggers for mobile cranes shall be qualified signal persons.
8. Roller block, hoist, lifting and mechanical pulling hooks shall be fitted with a safety latch or secured so that rigging components remain under control. Hooks designed to have a safety latch shall have the latch installed and, if inoperable or missing, the hook shall not be used.
9. Crane hooks shall not be painted.
10. Slings shall be used in accordance with the manufacturer's permanently attached identification markings.
11. If a rope is used as a sling for rigging and attached to a mechanical device, it shall have a splice in lieu of a knot. Anything being lifted by hand (on a hand line) can be lifted using a rope with a knot as long as the rope (including the knot reduction) is rated for the weight being lifted and it can be done safely.
12. When wrapping slings around sharp corners or edges, softeners or padding shall be used to prevent damage.

13. The manufacturer's recommendations for safe loading of ropes, cables, chains and slings shall not be exceeded.

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 occur 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 assure that ground preparations necessary are provided and inform the crane operator of the location of hazards beneath the equipment setup area such as voids, tanks or 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 assure 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 work on transmission and distribution lines and equipment.

1. Define the work zone.
2. Make a power line hazard assessment.

(continued)

3. If any part of crane can get closer than trigger distance (20 feet for lines under 350 kilovolts (kV); 50 feet 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 1 below. Determine the line's voltage by asking the utility AND implement the "encroachment prevention measures."
4. If Option 2 or 3 is 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 nonconductive.
    c. Erect elevated warning lines, barricades or line of signs.
    d. In addition to the three 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 1: Required Clearances for Operations Near Overhead Power Lines

Normal Voltage, kV (phase-to-phase)	Minimum Required Clearance (feet)
0 to 50	10
Over 50 to 200	15
Over 200 to 350	20
Over 350 to 500	25
Over 500 to 750	35

Note: Minimum required clearance is 10 feet plus 4 inches for every 10 kV over 50 kV.

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 operations.

1. The boom/mast and boom/mast support system must be lowered sufficiently to meet the requirements below.
2. The clearances specified in Table 2 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 2 to be breached.
4. If any part of the equipment while traveling will get closer than 20 feet of the power line, the employer shall assure 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 assure 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 2: Minimum Clearance Distances While Traveling With No Load and Boom/Mast Lowered

Voltage (nominal, kV, alternating current)	While Traveling Minimum Clearance Distance (feet)
Up to 0.75	4 (while traveling/boom lowered)
Over .75 to 50	6 (while traveling/boom lowered
Over 50 to 345	10 (while traveling/boom lowered)
Over 345 to 750	16 (while traveling/boom lowered)
Over 750 to 1,000	20 (while traveling/boom lowered)

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's 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 include 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

1. 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 percent of rated capacity. Frequency shall not exceed two in a continuous 12-month period.
3. Crane manufacturer shall be consulted if the planned engineered lift exceeds 125 percent of rated load or if frequency exceeds two 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 that identifies size and rated capacity for types of hitches (e.g., vertical, basket, choker, etc.).
3. Do not use a wire rope sling unless it is marked with a tag that 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.

Dropped Object Prevention in Fossil Generating Stations

1. Contractors performing work at Duke Energy facilities shall implement a dropped object prevention program. Contractor's dropped object prevention program shall be submitted to Duke Energy for review and acceptance. Contractor shall address equipment/materials/tools security and dropped-prevention system and control requirements in the site-specific health and safety plan.
2. When workers are exposed to falling objects, each worker shall wear a hard hat and shall implement one of the following measures.
    a. Install barricading: Red Danger barricade with appropriate signage shall be established in areas where objects could fall from elevated work areas. The barricade shall prohibit workers from entering the affected area and shall be large enough to confine dropped objects.
    b. In the event that an exclusion zone cannot be established with red barricade, or is physically not feasible, netting or other secondary catchment material shall be utilized locally at the work location to prevent the object from falling to the next level.
3. Additionally, where objects are stored on platforms and scaffolds, the following measures shall be implemented to prevent objects from falling from the platform.
    a. Erect toe boards, screens or guardrail systems to prevent objects from falling from higher levels.
    b. Erect a canopy structure and keep potential falling objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced.
    c. Barricade the area to which objects could fall, prohibit workers from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced.
4. Falling object protection shall comply with the following provisions:

a. Toe boards, when used as falling object protection, shall be erected along the edge of the overhead walking/working surface for a distance sufficient to protect workers below.

b. Toe boards shall be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or outward direction at any point along the toe board.

c. Toe boards shall be a minimum of 4 inches vertical height from their top edge to the level of the walking/working surface. They shall have not more than ¼ inch clearance above the walking/working surface. They shall be solid or have openings not over 1 inch in greatest dimension.

d. Where tools, equipment or materials are piled higher than the top edge of a toe board, paneling or screening shall be erected from the walking/working surface or toe board to the top of a guardrail system's top rail or midrail, for a distance sufficient to protect workers below.

e. Guardrail systems, when used as falling object protection, shall have all openings small enough to prevent passage of potential falling objects.

f. Debris netting shall be installed on guardrail systems where work is being performed.

g. Debris netting shall have openings no greater than ½ inch to prevent objects from passing through.

h. Debris netting utilized for below work protection shall have openings small enough to prevent passage of potential falling objects.

5. Prevent dropping of tools and equipment:

   a. Secure hand tools and equipment when working at heights.

   b. If using tethers, ensure they are intended for the purpose and inspected before and after each use.

   c. Tools weighing more than 5 pounds should not be attached to a person.

d. Ensure tethers are non-conductive when working around electrical equipment.

e. Do not use tethers around rotating equipment.

Electrical Safety for Transmission, Distribution and Metering

Job Briefing

1. Job briefings are required to be performed at the start or resumption of each work activity.
2. The employee-in-charge or designated crew member along with all crew members on the job site 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 employee-in-charge or designated crew member to ensure that briefings are conducted:
   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 worker safety
   f. At the conclusion of work to capture lessons learned
4. A brief discussion is sufficient if the work is routine and the workers, 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 workers are working alone, they shall conduct a job briefing. Documentation is not required.
7. Prior to working on electrical lines and equipment, workers shall determine existing conditions including:
   a. Nominal voltages of lines and equipment
   b. Maximum switching transient voltages (transmission voltages)
   c. Presence of hazardous induced voltages

d. Presence of protective grounds and equipment grounding conductors
e. Location of circuits and equipment and fire-protective signaling circuits
f. Condition of protective grounds and equipment grounding conductors
g. Condition of poles
h. Environmental conditions relating to safety

8. The job briefing shall include these topics:
   a. Existing conditions (see item 7)
   b. Work area protection setup
   c. Individual responsibilities
   d. Positioning of vehicles
   e. Underground utility locates
   f. Cover-up
   g. 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. Emergency plans
   n. Protective devices
9. Crews shall document job briefings.

Medical services and first aid

1. For transmission and distribution work, when two or more workers are working on exposed energized equipment, at least two 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.

Personal and electrical protective equipment

1. All personal protective equipment shall be properly worn per manufacturer's instructions.
2. Wear hard hats where there is possible danger of head injury from impact, bumping, falling or flying objects, electrical shocks or burns. In addition, hard hats are required when there is a need for public identification of a company employee.
3. Wear safety glasses where there is possible danger of eye injury from impact, flying objects, electrical flash or burns. Safety glasses must comply with ANSI Z87.1.
4. Before each day's use, inspect electrical protective equipment for visible defects.
5. Air test rubber gloves before each day's use and immediately after any incident that is suspected of causing damage.
6. Electrical protective equipment used by Duke Energy employees shall be tested as shown. Do not use equipment if the test date is exceeded.

   Test Frequency:

   Rubber gloves..... 4 months
   Rubber sleeves..... 4 months
   Blankets..... 12 months
   Line hose..... 12 months
7. 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.

8. Wear leather glove protectors over rubber gloves at all times. Do not use leather glove protectors for any other purpose.
9. Wear rubber gloves or gloves and sleeves in work situations as described in detail in the Work Methods Manual.
10. Work shoes should have substantial uppers made of leather or the equivalent, cover the entire foot with no openings, provide ankle support, and have slip-resistant soles. Office environment footwear should minimize the potential for slipping or tripping. Wear EH (electrical hazard) shoes as required by the Work Methods Manual.

Fall protection

1. Before climbing a wood pole, workers must determine if the pole is safe to climb as described in the Work Methods Manual. 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 a worker 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. Workers 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.
5. Workers 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. Clean/wax live-line tools used by Duke Energy employees every six months or as indicated by daily inspection.
3. Every two years, live-line tools shall be examined, cleaned, repaired if necessary and electrically tested as indicated in item 4.
4. Test all live-line tools manufactured to ASTM F711 used by Duke Energy employees every two years. This includes:
    a. Telescopic sticks and measuring sticks
    b. Shotgun sticks
    c. Switch sticks, hot cutters, T-handles and link sticks
    d. Extendo sticks

Materials handling and storage

1. In areas not restricted to qualified workers, do not store materials closer to energized lines or exposed energized parts than 10 feet for lines 50 kV and less. For lines over 50 kV, the distance is 10 feet 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 workers shall work on or with exposed energized lines or parts and in areas containing unguarded, uninsulated energized lines or parts of equipment at 50 volts or more.

3. When working around exposed energized parts, workers 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 volts or with exposed parts over 50 volts, use the appropriate tools or gloves. When installing expulsion-type fuses with one or both terminals energized over 300 volts, 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 workers shall be present for this work:
    a. Installation, removal or repair of lines over 600 volts
    b. Installation, removal or repair of de-energized lines if a worker is exposed to contact with other parts over 600 volts
    c. Installation, removal or repair of transformers, capacitors, and regulators if the worker is exposed to parts over 600 volts.
    d. Work involving the use of mechanical equipment, other than insulated aerial lifts, near parts over 600 volts
8. Workers may work alone for:
    a. Work involving equipment energized at 600 volts 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 worker 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

Working on or near exposed energized parts – 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.

Working on or near exposed energized parts – Minimum approach distances

1. No worker shall approach or take any conductive object closer to exposed energized parts than the minimum approach distances shown below unless:
   a. The worker is insulated from the energized part with rubber gloves or rubber gloves and sleeves AND the worker has positive control of the energized part.
   b. The energized part is insulated from the worker and from any other conductive object at a different potential OR
   c. The worker is insulated from any other exposed conductive object in accordance with requirements for live line bare hand work.
2. For voltages below 72.5 kV, employees shall utilize the minimum approach distances in Table 3 at locations with elevation less than 3,000 feet. At elevations over 3,000 feet, engineering analysis must be completed to determine minimum approach distances.
3. For voltages over 72.5 kV, employees shall utilize the minimum approach distances in Table 4 OR contact engineering for calculated distances.

(continued on page 38)

Table 3: Minimum Approach Distances for Voltages of 72.5 kV and Less

Nominal Voltage Phase-to-phase	Distance	
	Phase-to-ground exposure (feet)	Phase-to-phase exposure (feet)
50 to 300 volts	Avoid contact	Avoid contact
301 to 750 volts	1 ft. 1 in.	1 ft. 1 in.
751 volts to 5.0 kV	2 ft. 1 in.	2 ft. 1 in.
5.1 to 15.0 kV	2 ft. 2 in.	2 ft. 3 in.
15.1 to 36.0 kV	2 ft. 7 in.	2 ft. 11 in.
36.1 to 46.0 kV	2 ft. 10 in.	3 ft. 3 in.
46.1 to 72.5 kV	3 ft. 4 in.	4 ft.

Table 4: Minimum Approach Distances for Voltages of More than 72.5 kV

Nominal Voltage Phase-to-phase	Distance	
	Phase-to-ground exposure (feet)	Phase-to-phase exposure (feet)
72.6 to 121.0 kV	3 ft. 4 in.	4 ft. 7 in.
121.1 to 145.0 kV	3 ft. 10 in.	5 ft. 4 in.
145.1 to 169.0 kV	4 ft. 4 in.	6 ft. 3 in.
230.0 to 242.0 kV	5 ft. 8 in.	9 ft. 2 in.
345.0 to 362.0 kV	9 ft. 1 in.	14 ft. 3 in.
500.0 to 552.0 kV	11 ft. 11 in.	20 ft. 0 in.
700.0 to 765.0 kV	15 ft. 10 in.	31 ft. 0 in.

4. When a worker uses rubber gloves, he or she shall also use rubber sleeves UNLESS:
    a. Exposed energized parts on which the worker is not working are insulated from the employee AND
    b. When installing insulation for purposes of isolation, the worker installs the insulation from a position that does not expose his or her upper arm to contact with other energized parts.
5. Rubber gloves are required ground to ground, lock to lock and cradle to cradle. Exceptions are defined in the Work Methods Manual.
6. Low-voltage gloves (Class 0) with protectors are allowed on secondary voltages with management approval.

Working on or near exposed energized parts – 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 Methods 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.

Working on or near exposed energized parts – Apparel/arc flash protection

1. Wear flame-resistant (FR) clothing for electrical hazards as described in the Work Methods Manual.
2. Wear natural fiber garments under FR clothing. Do not wear undergarments made of acetate, nylon, polyester, rayon or polypropylene.
3. Outer layers of clothing shall be flame-resistant under any of these conditions:
    a. Worker is exposed to contact with circuits energized at more than 600 volts or

b. Electric arc could ignite flammable material in the work area that could ignite the worker's clothing or

c. Molten metal or electric arcs from faulted conductors in the work area could ignite the worker's clothing or

d. Estimated incident energy exceeds 2.0 cal/cm2.

4. Wear hand protection for electrical hazards as described in the Work Methods Manual. Hand protection shall consist of rubber gloves with leather protectors where there is a contact hazard or for work inside minimum approach distance. For work with an arc flash hazard but no contact hazard, heavy duty leather work gloves shall be worn for exposures up to 14 cal/cm2. Over 14 cal/cm2, arc rated gloves are required.

Working on or near exposed energized parts – Jewelry and conductive articles

1. No jewelry or conductive articles shall be worn by workers within the work zone while performing or observing physical work, other than in an office type environment or while driving. This includes loading and unloading material and any work at a job site or substation. This includes but is not limited to: finger rings, necklaces, earrings, body piercings, chains, wrist bands, wrist watches, key rings/chains, metal or plastic bracelets, or studs.
2. Eyeglasses and MedicAlert necklaces and bracelets are not considered jewelry and are exempt from this requirement. However MedicAlert necklaces and bracelets shall be worn under FR clothing or rubber protective gloves if working on energized conductors.
3. If there is a business need for a Bluetooth device to be worn on a job site, workers must conduct a hazard assessment to ensure that wearing the device will not put the worker(s) at risk for injury or cause distraction if a call is received. Bluetooth devices shall never be worn within minimum approach distance, when working from an aerial lift or aloft, or in a gaseous atmosphere.

Working on or near exposed energized parts – Face protection

1. In addition to hard hat and safety glasses, arc-rated face and head protection is required for tasks exceeding the exposures shown here. Specific tasks are described in the Work Methods Manual.
   a. Single-phase arc: Arc-rated face shields over 9 cal/cm2. Arc-rated hood or face shield with balaclava over 13 cal/cm2.
   b. Three-phase arc: Arc-rated face shield over 5 cal/cm2. Arc-rated hood or face shield with balaclava over 9 cal/cm2.
2. Face shields and approved safety glasses with side shields shall be used for these tasks when the systems are energized:
   a. Setting or removing three-phase self-contained meters (non-T-Rated).
   b. Working on all K type meter bases.
   c. Connecting or disconnecting underground parallel services.

De-energizing lines and equipment for worker 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 workers are at work. If an worker (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 workers 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 worker 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 workers are clear of the lines and equipment; and all tags have been removed.
13. If two or more crews will be working on the same lines or equipment
    a. The crews shall coordinate their activities with a single employee in charge of the clearance for all of the crews and follow the requirements of this section as if all of the workers formed a single crew OR

b. Each crew shall independently comply with this section and, if there is no system operator in charge of the lines or equipment, shall have separate tags and coordinate de-energizing and re-energizing the lines and equipment with the other crews.

Grounding for the protection of workers

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 worker 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 No. 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.
    a. Do not allow your body to come in contact with the grounding cable. Do not hold a grounding cable or clamp in your hand while installing grounds with a live-line tool.
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 workers 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. ***Note:*** Rubber gloves are not required in Transmission when using live-line tools to attach grounds.

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 workers 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 worker signals that it is safe to do so.
3. If the suspended load of a line truck endangers any workers, 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 workers 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. Mechanical equipment shall be operated so that the minimum approach distances in Tables 3 and 4 are maintained from exposed energized lines and equipment.
   a. However, the insulated portion of an aerial lift operated by a qualified worker in the lift is exempt from this requirement if the applicable minimum approach distance is maintained between the uninsulated portions of the aerial lift and exposed objects having a different electrical potential.
7. Ensure a designated worker 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 Methods 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.
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 an attendant.
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. If installing or removing conductors that cross over energized conductors in excess of 600 volts, render inoperative the automatic reclosing feature for the energized lines if permitted by the design of the circuit-interrupting devices protecting the lines.
9. Determine the voltage to be induced in the new lines before lines are installed parallel to existing energized lines.
10. 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 workers 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.
11. Keep reel handling equipment, including pulling and tensioning devices:
    a. In safe operating condition

b. Leveled

c. Aligned

12. Do not exceed load ratings of stringing lines, pulling lines, conductor grips, load-bearing hardware and accessories, and rigging and hoists.
13. Repair or replace defective pulling lines and accessories.
14. Do not use conductor grips on wire rope, unless the grip is specifically designed for the application.
15. Maintain reliable communications, through two-way radio or the equivalent, between the reel tender and the pulling-rig operator.
16. Operate the pulling rig only when it is safe to do so.
17. 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 workers 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 load line 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 feet 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 worker 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 worker 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 a worker working alone to enter a manhole briefly to inspect, housekeep, take readings, etc.

7. Maintain communications, through two-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 worker 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. Refer to the Work Methods Manual for precautions to be taken for work in a manhole or vault that could cause a fault in a cable.
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. Workers 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. Workers 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

1. 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. High-visibility flame-resistant shirts can be worn without traffic vests.

Ground Fault Protection for Personnel

1. Use ground fault circuit interrupter (GFCI) on all 120 volt, single-phase 15, 20 and 30 amp receptacles that are not part of the permanent wiring of a building or structure.

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.
   c. Energized equipment/circuits operate at less than 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:
   a. Worker is insulated from the energized part with rubber gloves or rubber gloves and sleeves and the worker has positive control of the energized part OR
   b. Energized part is insulated from the worker with line hose/blanket/etc.
2. For voltages below 72.5 kV, workers shall utilize the minimum approach distances in Table 5 at locations with elevation less than 3,000 feet. At

Table 5: Minimum Approach Distances for Voltages of 72.5 kV and Less

Nominal Voltage Phase-to-phase	Distance	
	Phase-to-ground exposure (feet)	Phase-to-phase exposure (feet)
50 to 300 volts	Avoid contact	Avoid contact
301 to 750 volts	1 ft. 1 in.	1 ft. 1 in.
751 volts to 5.0 kV	2 ft. 1 in.	2 ft. 1 in.
5.1 to 15.0 kV	2 ft. 2 in.	2 ft. 3 in.
15.1 to 36.0 kV	2 ft. 7 in.	2 ft. 11 in.
36.1 to 46.0 kV	2 ft. 10 in.	3 ft. 3 in.
46.1 to 72.5 kV	3 ft. 4 in.	4 ft.

Table 6: Minimum Approach Distances for Voltages of More than 72.5 kV

Nominal Voltage Phase-to-phase	Distance	
	Phase-to-ground exposure (feet)	Phase-to-phase exposure (feet)
72.6 to 121.0 kV	3 ft. 4 in.	4 ft. 7 in.
121.1 to 145.0 kV	3 ft. 10 in.	5 ft. 4 in.
145.1 to 169.0 kV	4 ft. 4 in.	6 ft. 3 in.
230.0 to 242.0 kV	5 ft. 8 in.	9 ft. 2 in.
345.0 to 362.0 kV	9 ft. 1 in.	14 ft. 3 in.
500.0 to 552.0 kV	11 ft. 11 in.	20 ft. 0 in.
700.0 to 765.0 kV	15 ft. 10 in.	31 ft. 0 in.

elevations over 3,000 feet, engineering analysis must be completed to determine minimum approach distances.

3. For voltages over 72.5 kV, workers shall utilize the minimum approach distances in Table 6 OR engineering analysis shall be conducted to determine minimum approach distances.
4. All unqualified persons shall maintain these distances from overhead power lines:
   a. For lines under 50 kV – 10 feet
   b. For lines over 50 kV – 10 feet plus 4 inches for every 10 kV over 50 kV.

Personal protective equipment

Table 7: Personal Protective Equipment for Electrical Work

This table describes personal protective equipment for electrical work.

	Work on Exposed Energized Parts **This includes but is not limited to: maintenance, repair, cleaning and installing/removing fuses**	**Voltage Testing**
50 to 600 volts	• Hard hat and safety glasses • Rubber gloves w/leather protectors	• Hard hat and safety glasses • See Note 1 on rubber gloves
Over 600 volts	PPE same as 50 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 50 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.)

Notes:

1. 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.
2. See "Arc Flash Protection" section below for information on FR clothing and face shield requirements for electrical work.

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 – 1,000 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 will be tested on these frequencies. Business unit-specific exceptions may apply.

   Test Frequency:

   Rubber gloves..... 4 months
   Rubber sleeves..... 4 months
   Blankets..... 12 months
   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.

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 assure the insulating material is not damaged.
3. Use insulated tools only for their designated purposes. Do not use insulated hand tools on circuits over 1,000 volts.
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. Coverings on the handles of tools not marked with double triangles shall not be considered as insulation.
6. 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. When work requires direct contact with electrical circuits, use voltage testing devices to verify that the equipment is de-energized.
3. Be aware that equipment can be fed by more than one source or can be actuated from more than one location.

4. 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.
5. Test for voltage initially, at shift change and after other work stoppage.
6. If the circuit to be tested is over 600 volts, check the test equipment for proper operation immediately before use. Follow the manufacturer's instructions for the device.
7. 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.
8. 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.
9. Verify that voltage testing devices are operating properly and that appropriate settings are used for the parameter and type of voltage to be checked.
10. 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.
11. 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.

Working position

1. Workers shall work in a position from which a slip or shock will not bring the worker's body into contact with exposed energized parts.
2. For exposed energized parts over 600 volts, work from a position where you cannot reach into the minimum approach distance unless wearing rubber gloves or using live-line tools.

Arc flash protection

1. The following items apply to workers who are exposed to arc flash hazards.
2. Refer to detailed arc flash protection requirements in business unit-specific procedures.
3. Do not wear clothing that could melt onto the skin or that could ignite and continue to burn when exposed to heat energy from electric arcs. This includes acetate, nylon, polyester, rayon and polypropylene. These fibers are allowed when blended with FR fabrics (such as Nomex/rayon blends).
4. Outer layers of clothing shall be arc-rated flame-resistant under any of these conditions:
    a. Worker is exposed to contact with circuits energized at more than 600 volts.
    b. Electric arc could ignite flammable materials in the work area that could ignite the worker's clothes.
    c. Molten metal or electric arcs from faulted conductors could ignite the employee's clothing.
    d. Estimated incident energy exceeds 2.0 cal/cm2 as determined by business unit arc flash analysis. FR clothing shall have an arc rating greater than the heat energy estimated as determined by business unit arc flash analysis.
5. Hand protection shall consist of rubber gloves with leather protectors where there is hazard of electrical contact. Where there is flash hazard but not contact hazard, workers shall wear heavy-duty leather work gloves. The work gloves must be arc-rated for exposures over 14 cal/cm2.
6. Wear heavy-duty work shoes or boots. Footwear does not have to be arc rated.
7. In addition to hard hat and safety glasses, arc-rated face and head protection is required for these exposures:

Table 8: Exposures Requiring Arc-Rated Face and Head Protection

	No head or face protection required	Arc-rated face shield with minimum rating of 8 cal/cm2	Arc-rated hood or face shield with balaclava
Single-phase exposure in air*	< 8 cal/cm2	9 to 12 cal/cm2	13 cal/cm2 or higher
Three-phase exposure	< 4 cal/cm2	5 to 8 cal/cm2	9 cal/cm2 or higher

* Single-phase and three-phase refer to the exposure – not the system voltage. Business units will define the tasks with these exposures.

Grounding

1. When grounding lines and equipment for the protection of workers, assure 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 assure 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 T&D installations, grounds shall be attached to and removed from the line or equipment with a live-line tool.

Tools, equipment and 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 (fiberglass) side rails.
3. Do not use portable space heaters without prior approval from your supervisor and site/facilities management. 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. Before replacing fuses, verify that ratings and types are correct.
5. Appropriate tools shall be used for installing and removing fuses.
6. 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.
7. Secure or remove doors, hinged panels, etc., to prevent them from swinging into a worker and causing contact with exposed energized parts.
8. Do not obstruct access to electrical equipment.

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, nails, etc., 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. To prevent shocks, avoid physical contact with exposed conductors on batteries.
3. Do not remove vent plugs from cells, unless specific maintenance work is being performed. Immediately reinstall vent plugs after work is completed.
4. Before performing battery-related tasks, check the location of the nearest eyewash or eyewash/shower. If the plumbed eyewash/shower has not been tested within the last week, test it before working on the batteries.
5. Battery-related tasks may be performed by persons working alone. Ask for assistance if necessary.

6. Provide adequate ventilation in battery rooms.
7. When charging, repairing or servicing batteries, follow manufacturer's recommendations.
8. Wear appropriate personal protective equipment for work on batteries.
    a. Eye protection, full-face shield, chemical resistant gloves, full-body apron and protective footwear to:
        i. Add/remove electrolytes (acid)
        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

Switchyards at generating plants

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 pre-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. Assure switching operations are performed only by qualified persons.
9. For all live-line tools:
    a. Wipe clean and inspect daily before use. Properly wax as needed.
    b. Every two 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.
10. Carry or place conductive material so as to prevent contact with energized lines, equipment or busses.
11. Do not use metallic cloth tapes, metal tapes, metal rules or other conductive material near energized conductors or equipment.
12. Before applying grounds, de-energize static capacitors for five minutes.
13. Attach fall protection only to designated substantial anchorage points; do not attach to conductors or cables.
14. Do not use portable metal or other conductive ladders in substations.
15. Ensure transformer cooling fans that are less than 7 feet above the ground are provided with guards that have openings less than ½ inch.

Ground fault protection for personnel in construction

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 two-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.

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, magnetic separators, generator brush rooms and other locations such as substations. Office areas do not present a risk.
2. Workers 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 workers to report medical devices, but they should consider doing so.
    b. While cochlear implants and hearing aids may be affected, they should not present a life-threatening risk.
3. Personnel with medical devices should not enter generating plant switchyards due to potential for high electromagnetic fields.
4. If there appears to be an immediate hazard related to medical device operation and high levels of EMF:
    a. Stop work.
    b. Move away from the high EMF source.
    c. Contact your supervisor.

Elevating Work Platforms

General

1. This section outlines requirements for the operation of boom-supported elevating work platforms, self-propelled elevating work platforms and manually propelled elevating work platforms (JLGs, Genies and scissor lifts).
2. The operator shall assure the operating and maintenance manuals are available.
3. The operator shall comply with manufacturer's warnings and instructions.
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.

Pre-start inspection

1. Before use each day, pre-start inspection shall be conducted in accordance with operator's manual.
2. Any problems or malfunctions shall be repaired prior to use of the platform.

Workplace inspection

1. Before the elevating work platform is used and during use, the operator shall check the area for possible hazards including:
    a. Drop-offs, holes and slopes
    b. Bumps and floor obstructions
    c. Debris
    d. Overhead obstructions and electrical conductors
    e. Hazardous atmospheres
    f. Inadequate surface and support to withstand load forces imposed by the aerial platform

g. Wind and weather conditions
h. Presence of unauthorized persons
i. Other possible unsafe conditions

2. Prior to each operation, the operator shall assure:
   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. Assure personnel in the worksite area that may be affected are aware of the movement, communicating and maneuvering the 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 assure 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. For lines under 50 kV – 10 feet
      ii. For lines over 50 kV – 10 feet plus 4 inches for every 10 kV over 50 kV

Eyewash and Emergency Showers

1. Personnel shall assure that emergency showers and eyewash basins in the immediate work area are operable before starting work.
2. Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be easily accessible, unobstructed and able to be located within 10 seconds. For a strong acid or caustic, the eyewash should be immediately adjacent to the hazard.
3. Know the effects of chemicals with which you are working. Read, ask questions about and understand SDS for each chemical with which you work.
4. Always wear personal protective equipment suitable for the material.
5. Prior to starting work, flush plumbed eyewash/showers if they have not been flushed in the last week.
6. Know how to help others reach showers and eyewashes and how to help them get medical assistance.
7. Immediately wash off even small amounts of chemicals.
8. In case of chemical exposure, flush skin and eyes with cool water for at least 15 minutes. Do not rub.
9. Hold your eyes open with your hands while using an eyewash to be sure water reaches the eyes.
10. Remove contaminated clothing after the shower has been activated.
11. Get medical assistance immediately following flushing.
12. If possible, continue flushing while on the way to medical help.
13. Keep covers on nozzles to prevent contamination.

Emergency Response

1. Be familiar with emergency procedures, including site-specific emergency plans.
2. Provide safety observations or concerns to your supervisor or the H&S/ EHS professional.
3. In the event of a chemical emergency, do the following if it is safe to do so:
   - **S**ecure the scene.
   - **W**arn others.
   - **I**nform the appropriate facility personnel.
   - **M**onitor the situation until qualified emergency response personnel arrive.
4. Where applicable, be able to recognize the emergency evacuation signals.
5. Be familiar with 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 appropriate response plans. Inspect emergency response equipment prior to use.
    c. Inform the response team leader of any medical or other personal issues that would prevent you from safely participating in a response.

Ergonomics

Work practices to avoid musculoskeletal disorders

1. Workers should be cognizant of the primary risk factors that can lead to the development of musculoskeletal disorders (MSD):
    a. Awkward postures
    b. Excessive force
    c. Excessive repetition
    d. Contact stress (hard edge/pressure)
    e. Heavy vibration (increased risk at cold temperatures)
2. Workers 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. Workers should recognize the symptoms of musculoskeletal disorders:
    a. Persistent numbness
    b. Burning sensation
    c. Pain
    d. Tingling
    e. Cramping
    f. Stiffness
4. Suggestions for avoiding ergonomic injuries include:
    a. Alternate work patterns and tasks as much as possible throughout the day to allow rest for different muscle groups.

b. Perform stretching exercises periodically throughout the workday to relieve stressed muscles.

c. Keep your body in "neutral" positions as much as possible.

d. Always use good posture.

e. Begin or continue a physical fitness program after consulting your health care provider.

5. Report MSD signs and symptoms through normal incident reporting process.

Workstations

1. When working at a computer workstation, workers should consider the following:

   a. Adjust working height of chair, desk and keyboard.

   b. Sit in an upright position using good posture.

   c. Adjust monitor and copy stand side by side and at a comfortable viewing angle.

   d. Set angle of monitor and copy to reduce glare.

   e. Keep wrists and hands in line while using keyboard and mouse. Avoid bending wrists forward or backward.

   f. When using a video display terminal, blink frequently to maintain eye surface moisture.

   g. To prevent eye fatigue, momentarily focus eyes on a distant object.

   h. When using a video display terminal for prolonged periods, frequently stretch and move head, neck, shoulders and arms to prevent buildup of muscle tension.

   i. Assure 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.

j. When continuously and simultaneously using the telephone and computer, use telephone headrest, headset or speakerphone to prevent injury.

k. Organize work areas to avoid stretching/twisting to reach items.

Manual transport

1. When performing manual transport or storage operations, employees should consider:

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

   b. When handling materials, workers should use the following techniques if mechanical equipment is not available:

      i. Lifting

         1. Keep the load close to your body.
         2. Bend your knees and hips.
         3. Lift with your legs.
         4. Avoid twisting as you lift.
         5. Get help when needed.

      ii. Bending

         1. Kneel on one knee.
         2. Bend knees and hips, not your back.
         3. When leaning forward, move your whole body, not just your arms.

      iii. Repetitive motions

         1. Keep the load small.
         2. Turn your whole body instead of twisting.
         3. Get close to the load; do not reach and lift.

4. Lift with your arms and legs, not your back.
5. Change positions frequently.

iv. Reaching

1. Reach only as high as is comfortable; do not stretch.
2. If you need to reach beyond your comfort level, use a ladder.
3. Test the weight of the load before lifting. Let your arms and legs do the work, not your back.

v. Pushing and pulling

1. Stay close to the load; do not lean forward.
2. Push the load rather than pulling.
3. Use both arms.
4. Get help when needed.

Fall Protection and Walking/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. Fall hazards and protective measures shall be included in pre-job briefing discussions and job planning as appropriate.
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 Table 10: Fall Protection Requirements for Specific Construction Activities.
6. Fall protection for wood poles, towers and other transmission and distribution structures is described in the Work Methods Manual.
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 two.
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 9: Fall Protection Equipment Inspection Guidelines

Inspect	For evidence of defect or damage including:
Hardware D-rings Buckles Connectors, etc.	Cracks, sharp edges, deformation, corrosion, chemical attack, excessive wear, alterations excessive heating
Ropes Straps Lines Cables	Fraying, unsplicing, unlaying, kinking, knotting, broken or pulled stitches, excessive elongation, chemical attack, abrasion, excessive wear, excessive lubrication
Mechanical devices Rope grabs Connectors	Improper functioning, absence of parts

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 with a safety factor of two shall be designed, installed, and used under the supervision of a qualified person.
14. Workers who are on surfaces at any height above dangerous equipment shall be protected by 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 forklift trucks, assure:
    a. Workers are protected from moving parts of the truck and falling objects overhead.

b. Platforms are at least 18 inches wide.

c. The platform has guardrails or the worker wears fall arrest equipment.

d. Platforms are secured to the forklift according to manufacturer's recommendations.

17. For the nonworking side of loading docks with a fall hazard of 4 feet or greater, install guardrails or assure 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.
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 reuse until a competent person inspects them and determines them undamaged and suitable for reuse. Work with your H&S/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. When wearing a fall arrest harness, take precautions to assure 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, assure 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 toe board.
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 toe boards.
7. A floor hole that is less than 1 foot in the least dimension and that provides for the passage of machinery, piping or other equipment that may expand, contract, vibrate and/or move shall be at least guarded by a toe board to prevent a worker's feet from entering the hole and tools or debris from falling on workers below.
8. Assure 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.
10. On stairs, hold handrails where available.

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. Use three points of contact.
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. Labels on portable ladders must be legible.
11. Portable ladders must be equipped with non-skid 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 the ladder shall be secured at the top, if possible. If the work requires both hands while working on a secured ladder, use personal fall arrest equipment or work positioning equipment (body belt).
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 or 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 is required for fixed ladders more than 24 feet in height.
19. Fall protection shall be provided at fixed ladder access openings.
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

Vehicle repair pits

1. Vehicle repair pits and assembly pits over 4 feet but less than 10 feet deep do not need to be protected by a fall protection system, provided that the following requirements are met:
   a. Access within 6 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 6 feet from the edges of the pits.
   d. Caution signs stating "Restricted Area," "Authorized Personnel 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.

Specific requirements for construction activities

Table 10: Fall Protection Requirements for Specific Construction Activities

For construction work on this surface:	The fall protection system required is:	Additional information
Surfaces with unprotected sides and edges 6 feet or more above lower levels. These are surfaces that are not listed below.	Guardrail system, safety net system or personal fall arrest system.	
Leading edges 6 feet or more above lower levels for workers engaged in the leading edge work. Erecting **precast concrete members** (including erection of wall panels, columns, beams, and floor and roof "tees") and when performing related operations 6 feet or more above lower levels. **Residential** construction activities 6 feet or more above lower levels.	Guardrail system, safety net system or personal fall arrest system.	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.
Workers who are working on a walking/working surface 6 feet or more above a lower level where **leading edges** are under construction, but who are not engaged in the leading-edge work.	Guardrail system, safety net system or personal fall arrest system.	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.

For construction work on this surface:	The fall protection system required is:	Additional information
Hoisting areas more than 6 feet above lower levels.	Guardrail system or a personal fall arrest system.	Note: If guardrail systems are removed during hoisting operations, assure workers leaning through the access opening or over the edge use personal fall arrest systems.
When working around **holes** (including skylights) more than 6 feet above lower levels. This includes holes created by temporarily removing grating.	Personal fall arrest system, cover or guardrail system erected around the holes.	Cover holes (including skylights) to protect workers from tripping in or stepping into or through holes and objects falling through holes.
Formwork and reinforcing steel 6 feet or more above lower levels.	Personal fall arrest systems, safety net systems or positioning device systems.	
Ramps, walkways and runways 6 feet or more above lower levels.	Guardrail systems.	
Edges of excavations 6 feet 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 feet or more in depth.	Guardrail systems, fences, barricades or covers.	
When working **less than 6 feet** above **dangerous equipment.**	Guardrail systems or equipment guards.	

For construction work on this surface:	The fall protection system required is:	Additional information
When engaged in overhand **bricklaying** and related work 6 feet or more above lower levels.	Use guardrail systems, safety net systems, personal fall arrest systems or controlled access zones. When reaching more than 10 inches below the level of the surface being worked on, use a guardrail system, safety net system or personal fall arrest system.	Note: This does not apply to bricklaying done from scaffolds. (See OSHA, 1926, Subpart L.)
When doing **roofing work on low-slope roofs** with unprotected sides and edges 6 feet or more above lower levels.	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 • Warning line system and safety net system when workers are outside the warning line • Warning line system and personal fall arrest system when workers are outside the warning line • Warning line system and safety monitoring system when workers are outside the warning line	Note: On roofs 50 feet or less in width, using a safety monitoring system alone (without the warning line system) is permitted.

For construction work on this surface:	The fall protection system required is:	Additional information
All work activities on low-slope **roofs** that are not related to roofing work.	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.	
Inspections prior to the actual start of construction work or after construction work has been completed.	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.	
Steep roofs with unprotected sides and edges 6 feet or more above lower levels.	Guardrail systems with toe boards, safety net systems or personal fall arrest systems.	
When working on, at, above or near **wall openings** (including those with chutes attached) when the outside bottom edge of the wall opening is 6 feet or more above lower levels **and** the inside bottom edge of the wall opening is less than 39 inches above the walking/working surface.	Guardrail system, safety net system or personal fall arrest system.	

For construction work on this surface:	The fall protection system required is:	Additional information
Where the potential for **falling objects** exists, use hard hats and do **one** of the following:	1. Erect toe boards, 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.	
Scaffold erection and use.	See the H&S Manual Scaffold Program.	

Fire Prevention and Protection/Means of Egress

Means of egress

1. Keep exits and exit routes unobstructed.
2. Do not lock exit doors closed.
3. Do not store any flammable or combustible material in an exit route or stairwell.
4. Fire doors and dampers must never be tied or blocked in the open position or otherwise made inoperative.
5. Do not block emergency alarm pull stations.

Fire prevention

1. Be familiar with site procedure for reporting and/or responding to a fire.
2. Know how to recognize and report hazardous conditions and fire hazards associated with the materials and processes to which workers are exposed.
3. Practice good housekeeping in all buildings and vehicles to prevent the accumulation of flammable and/or combustible material.
4. Keep flammable liquids in approved containers that are properly labeled, and store them in designated cabinets or storage areas away from ignition sources.
5. Do not store combustible materials in a flammable liquids storage area.
6. Return flammable liquids and aerosols to designated storage areas when not in use.
7. Keep flammable liquids storage cabinets and rooms closed.
8. Smoke only in designated areas.
9. Know and follow the site's requirements for the handling of oily rags.
10. Do not transfer flammable liquids into containers unless the nozzle and container are electrically interconnected (bonded).

11. 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).
12. Do not use flammable or combustible liquids for general cleaning purposes.
13. Wash parts with flammable or combustible liquids in equipment UL/FM listed/approved for that purpose.
14. Locate and use parts-washing equipment in areas adequately ventilated to prevent accumulation of vapors.
15. Keep parts-washing equipment closed when not in use and assure that the fusible-link closure is intact and operational.
16. Do not store compressed gas cylinders with flammable or combustible liquids.
17. Do not place objects or materials in front of electrical panels or disconnects that restrict clear access to the equipment.
18. Keep electric control panel covers in place and/or doors closed.
19. Do not store supplies or other materials inside electrical rooms or cabinets or on electrical cabinets, panels or fixtures.
20. Use small appliances (coffee makers, toasters, etc.) in accordance with the UL rating. (Check the specifications plate on the appliance.)
21. Do not use portable space heaters without prior approval from your supervisor and site/facilities management. 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.
22. Conduct spray finishing operations only in approved designated areas.

Fire protection

1. Report any damaged or spent portable fire extinguishers to appropriate personnel.

2. Do not block or restrict access to fire extinguishers or other fire-protection equipment.
3. Fire extinguishers and other fire-protection equipment should not be used 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 H&S/EHS professional.

Handling Hazardous Chemicals/Substances

General chemical safety

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 SDS 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 the bags.
    e. Clean the contaminated area. During the cleanup, use care to avoid further spread of the contamination.
    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 eyewash/shower facilities before performing tasks.

   h. Use personal protective equipment as specified by SDS, policy or job hazard analysis, etc.

5. Conduct industrial hygiene 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 where practical.
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. Bulk loading or unloading of chemicals shall be performed by procedure and continuously observed.
9. 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 taping.
   e. Comply with Department of Transportation requirements where applicable.

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. 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.
3. Open flames and smoking are prohibited when working with or near acid in metal containers, such as tanks, condensers or boilers.
4. Storage of acids and caustics:
    a. Acids, in any quantity, must be kept in an approved 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. Workers handling acids, caustics or other corrosive and toxic chemicals must wear personal protective equipment such as gloves, aprons, eye and face protection, etc.
    e. Storage areas for acids and caustics must be posted with appropriate warning signs.
5. 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 and type of acid or caustic handled will determine the kind and quantity of clothing and equipment.
    b. Should any acids or caustics 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 where acids and caustics are handled.
6. Before an acid or caustic container is lifted or moved, it must be examined carefully to see that it is not leaking or defective.

Hazard Awareness

1. Identify potential pinch points prior to each task so these hazards can be eliminated or avoided.
2. When working overhead, keep tools and small materials not in use in belts or in an appropriate container.
3. Do not throw, toss or drop tools, material or trash unless the action has been discussed and determined to be the safest method during the job briefing. Tools or material shall not be tossed from one individual to another at any time.
4. Workers should not position themselves where they could be struck by falling, flying and moving objects. Protection against these hazards shall be discussed and mitigated prior to starting work. Three-way communication must be maintained when entering and exiting work areas.
5. Prior to entering or exiting areas such as parking lots, offices, hallways, elevators, restrooms and break rooms, workers should be aware of the movement of others or equipment and take action to avoid injury.
6. Inspect work locations prior to beginning work to identify potential hazards from animal and insect bites and stings. Animal and insect repellants, devices and protective apparel shall be used as necessary.
7. Access job sites safely. Do not jump over fences, hedges, bushes, excavations or other obstacles. If required to climb a fence, maintain a controlled ascent and descent.
8. Horseplay is prohibited.

Hazard Communication

1. Workers must know how to access SDS for hazardous chemicals they are exposed to at work. SDS were formerly known as Material Safety Data Sheets (MSDS).
2. Notify supervision if label is missing or cannot be read.
3. Use only materials/chemicals that are appropriately labeled. Exception: Secondary containers do not require labels if under constant user control and used within the shift.
4. Follow label instructions for chemical use and storage unless otherwise instructed by H&S/EHS professional.
5. The handling of a chemical shall be in accordance with the precautions and personal protective equipment specified in the SDS for that chemical unless otherwise instructed by H&S/EHS professional.
6. Wear proper personal protective equipment when handling chemicals.
7. Prior to activities that can create chemical exposures (e.g., conducting maintenance on systems or handling hazardous chemicals), review in pre-job briefings health hazards that could be generated as part of the activity. This includes reviewing the SDS for the product.
    a. Remember to review hazards that can be generated by the activity, not just the chemicals used. For example, consider potential for health hazards that could occur during tasks such as welding or coating disturbances.
8. When working at another company's facility or alongside another company's workgroup, you have a right to request SDS for their chemicals to which you are potentially exposed. Likewise, they can request copies of SDS for chemicals being used by Duke Energy employees.
9. Chemical wastes generated during maintenance on systems or equipment containing hazardous chemicals shall be handled in accordance with environmental procedures.

10. Personnel shall be familiar with the location of first-aid supplies and assure that emergency showers and eyewash basins in the immediate work area are operable before starting work.
11. Follow procedures for loading and unloading bulk hazardous chemicals from tanker trucks or rail cars.

Hearing Conservation

1. Hearing protection shall be worn while working in all areas where the noise level is equal to or greater than 85 dB and in areas where workers cannot carry on a conversation in normal tones within 2 to 3 feet of each other.
2. Hearing protection shall be worn according to the instructions on signs and labels identifying potential high-noise exposure.
3. Contact an H&S/EHS professional for the appropriate type of hearing protection required.

Heat and Cold Exposure

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 in extreme temperatures.

Heat/cold

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.
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., clothing, eye protection, sunscreen).
7. Permit workers to interrupt their work if experiencing signs of heat-related disorders or extreme discomfort.

8. Observe co-workers for symptoms of heat-related illness. When necessary, seek medical attention. Symptoms include but are not limited to dry, hot skin and high body temperature (heat stroke), moist clammy skin (heat exhaustion) and heat cramps.
9. When working in cold environments, dress to stay warm and dry. Use rain gear, layered or insulated clothing as appropriate.
10. Observe co-workers for symptoms of frostbite and hypothermia. When necessary, use warming shelters or vehicle cabs for temporary relief. Seek medical attention when appropriate.
11. Walk carefully on snowy and icy surfaces.
12. When shoveling snow, be very careful to avoid overexertion.
13. Soaking wet clothing contributes to hypothermia and should be removed as soon as possible.
14. Use of vibrating tools in extremely cold weather could aggravate a circulatory condition called Raynaud's Syndrome and should be avoided by affected individuals.
15. Avoid heat-related illness by maintaining adequate levels of hydration. This table provides general length of time between water breaks and corresponding hydration target for each hour of work.

Temperature	Work Level	Maximun Minutes Worked Between Hydration Breaks	Hydration Target
<80	Normal		8-12 oz./hr.
80-85	Normal		8-16 oz./hr.
86-90	Normal	50	12-20 oz./hr.
91-95	Normal	45	16-24 oz./hr.
>96	Normal	40	24-32 oz./hr.

Hexavalent Chromium

1. Be aware of activities that may produce or disturb hexavalent chromium. Activities of concern include:
   a. Hot work on or demolition of coated 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. Work activities disturbing fly ash, ceramic bricks or treated wood
2. Use exposure control methods 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 washing, etc.)
   d. Establishing "regulated areas" where the exposure limit might be exceeded
   e. Use of personal protective equipment (such as coveralls, gloves, safety glasses, face shield, etc.) and respiratory protection
3. Where protective clothing and equipment is required for hexavalent chromium protection, use change rooms with separate, contamination-free storage facilities for street clothes.
4. Do not take contaminated clothing or equipment home.
5. Do not wear dusty or contaminated clothing into break rooms, lunch rooms or other areas where food and drink are stored or consumed.
6. 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).

7. Where used, empty or change HEPA vacuums/filters in accordance with department or site work practice, to minimize exposure and to assure appropriate waste disposal.
8. Do not blow off, shake off or do anything else to contaminated materials that could send dust or particulate debris into the air.
9. Do not dry sweep, shovel or brush hexavalent chromium dust or contaminated products. Use HEPA vacuum.
10. Wash face and hands before breaks and at end of shift.
11. Do not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in regulated hexavalent chromium areas.
12. Label waste bags, bags of clothing or equipment or other containers of hexavalent chromium materials according to the Hazard Communication program in the H&S Manual. See your environmental professional for disposal guidance.
13. Do not enter a hexavalent chromium regulated area unless you are properly trained.

Hot Work Program

1. A hot work permit is required for any temporary operations involving flames or producing heat and/or sparks.
2. Before performing welding, cutting or grinding, evaluate and safeguard the work area for combustible items.
3. Use the business unit or location-specific hot work permit.
4. Before using the hot work permit, be familiar and understand the requirements.
5. Assign a fire watch with a suitable fire extinguisher for welding, cutting and grinding operations in work areas with combustible materials or where the fire or sparks cannot be contained in the immediate work area.
6. When using a fire watch, continuously monitor the hot work area while work is taking place and for 30 minutes following the completion of work. Then perform final inspection.
7. Assure the person assigned to fire watch has been properly trained.
8. Keep welding, cutting and grinding areas clean and free from accumulations of trash, rags and other combustible items.
9. All combustible materials must be removed or covered within a 35-foot radius of the hot work location.

Housekeeping

1. Keep work areas, job sites and vehicles 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. Clean up spills immediately.
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. Assure staged equipment does not create unsafe conditions by obstructing safe access to operating or emergency equipment, or by exceeding weight limits.
9. Use adequate lighting to perform work safely.
10. Keep access to emergency exits clear.
11. Keep rolling stock (pipe, conduit, all-thread, etc.) off of the floor or designate a marked storage area to eliminate trip hazards.

Incident Reporting and Investigation

1. Employees shall report all health and safety incidents to supervision immediately. This includes work-related injuries and illnesses, near-miss incidents, vehicle accidents, fires, explosions and other situations.
2. Supervisors shall report incidents to their management and H&S/EHS professional. Submit initial report within 24 hours.
3. H&S/EHS professionals will work with supervision to investigate incidents as defined in EHS Event Reporting and Investigation.

Inorganic Arsenic

1. Do not enter inorganic arsenic regulated areas unless you are properly trained.
2. Use respirators, coveralls, gloves and other personal protective equipment as specified by supervision or H&S/EHS professional for work in inorganic arsenic regulated areas.
3. 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.
4. Wash face and hands prior to break. Shower at the end of the work shift.
5. Never shovel or sweep fly ash 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.)
6. Where protective clothing and equipment is required for inorganic arsenic protection, use change rooms, with separate contamination-free storage facilities for street clothes.
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. Assure that inorganic arsenic-contaminated protective clothing is:
    a. Removed at end of the task or end of the shift (whichever comes first)
    b. Placed in closed container that is labeled per the requirements of 29 CFR 1910.1018 – Inorganic Arsenic
9. Where used, empty or change HEPA vacuums/filters in accordance with department or site work practice to minimize exposure and to assure appropriate waste disposal.
10. Never blow off, shake off or do anything else to contaminated materials that could send dust or particulate debris into the air.
11. Never carry coveralls, protective equipment or other contaminated materials home.
12. Certain activities, such as eating, drinking, smoking, chewing gum or tobacco, or applying cosmetics, are prohibited in regulated areas.

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
   f. Lead contamination/cleanup
2. Contact H&S/EHS professional to determine if lead exposure exists.
3. As practical, substitute less hazardous materials (such as lead-free paints) or processes (such as paint strippers) as the first choice to eliminate the airborne exposure potential.
4. When indicated by exposure assessments, 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
   d. Use of personal protective equipment (such as coveralls, gloves, safety glasses, face shield, etc.) and respiratory protection
5. Where protective clothing and equipment are required for lead protection, use change rooms, with separate contamination-free storage facilities for street clothes.
6. Do not wear contaminated clothing into break rooms, lunch rooms or other areas where food and drink are stored or consumed.

7. Do not carry coveralls, protective equipment or other contaminated materials home.
8. Assure that lead-contaminated protective clothing is:
   a. Removed at end of the lead task or end of the shift (whichever comes first)
   b. Placed in closed container, which is labeled per OSHA requirements
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. Wear respiratory protective devices for any lead-disturbing work, unless the work activity has specifically been identified as not requiring respirators.
11. Follow all company and/or location-specific requirements of the respiratory protection program.
12. Empty or change HEPA vacuums/filters in accordance with department or site work practice to minimize exposure and to assure appropriate waste disposal.
13. Do not blow off, shake off or do anything else to contaminated materials that could send dust or debris into the air.
14. 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.)
15. Wash face and hands before breaks and at end of shift.
16. Shower at the end of the shift after performing activities where lead concentrations exceed the PEL.
17. Do not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in areas where lead work occurs.
18. Do not enter a lead-regulated area without proper training.
19. Collect, handle, label and properly dispose waste material (such as removed paint, abrasive blast material, HEPA filters, contaminated clothing or equipment). See H&S/EHS professional for specific requirements.

Lockout/Tagout for Facilities other than Transmission, Distribution and Generation

1. Workers shall be trained in the requirements of the lockout/tagout procedure in use 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.
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. For transmission, distribution and generation activities, follow business unit-specific lockout/tagout procedures.

Machine Guarding

1. Before starting work using powered machinery or tools, assure 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. Are appropriate for the equipment
2. Do not create new hazards by having a shear point, jagged edge or an unfinished surface that can cause a laceration.
3. Report any broken or missing guards to your supervisor. Do not use the tool until repairs have been made.
4. Before working, perform a pre-job safety assessment to identify potential hazards to the hand.
5. When working around machinery with rotating or moving parts:
   a. Assure 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.

Methylene Chloride

1. Review SDS and labels to determine if products contain methylene chloride.
2. 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.
3. Use methylene chloride-free products where possible.

Motor Vehicle Operations

Distracted driving

1. Texting, reading texts and emailing are prohibited when driving company vehicles and when driving personal vehicles on company business.
2. Follow state and local regulations on use of cellphones when driving.
3. Focus on the primary task of driving. Keep the number of calls to a minimum amount and duration.
4. Refer to additional business unit-specific restrictions on distracted driving and cellphone use.
5. Use pagers and radios responsibly while driving.
6. Avoid other activities that may distract your driving. Pull over or park in safe locations to perform these activities.
7. For commercial motor vehicles: Driver use of hand-held cellphones is prohibited when driving commercial motor vehicles. Hand-held cellphones 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 cellphone or headset.
8. For non-commercial motor vehicles: Do not use a cellphone when driving unless necessary. If you have to use a cellphone, it must be used with a hands-free device.

Operational practices

1. Operate all vehicles in a safe manner, using defensive driving techniques. Do not drive aggressively.
2. Drivers/operators shall have full responsibility for vehicles in their possession. This includes observing all federal, state and local laws and ordinances.

3. Drivers shall be properly licensed when operating company-owned, rented, leased vehicles or equipment, and personal vehicles when used on company business. Any license restrictions shall be adhered to at all times.
4. Before operating a vehicle, visually inspect it to determine whether the vehicle is safe to operate. Perform a "360 degree" inspection around the vehicle to be sure the area is clear. Do not operate unless equipment is in safe condition.
5. Seat belts, where provided, shall be worn by the driver and passengers at all times when the vehicle or equipment is in motion. This shall apply to all company-owned, rented, leased vehicles or equipment, and to personal vehicles when used on company business or on company property.
6. Passengers in motor vehicles shall be in approved riding positions and restrained where occupant restraints are provided.
7. Lock unattended vehicles and remove keys to reduce the risk of vehicle theft.

Backing and chocking

1. If you can pull through into a parking place, do so, instead of backing the vehicle into the space.
2. When a second person is available, they should assist the driver with backing.
3. Refer to business unit-specific procedures on backing and chocking vehicles.

Work carts

1. Workers riding in work carts shall use safety handholds and proper foot positioning as needed to maintain stability while en route.
2. Operators of work carts shall ensure that passengers are aware of changes in road/terrain conditions so they do not get thrown out of the cart.

Emergencies

1. In case of any vehicle trouble, pull off to the right side of the road, if possible, and use emergency flashers and warning signals.
2. Refer to the "Use in Case of an Accident Form" located in the company vehicles for actions to take if you have an accident in a company vehicle.

Incident reporting

1. If an employee is in an accident involving a company-owned vehicle, leased (rental) or personal vehicle being used on company business, supervision or designee contacts H&S/EHS professional to enter information into eTRAC Incident.
2. If an employee has an injury from any kind of vehicle accident while on company business, supervision or designee contacts H&S/EHS professional to enter information into eTRAC Incident.
3. Employees who receive a citation for the violations listed below while operating any Duke Energy-owned vehicle shall report the citation immediately to their supervisor:
    a. Moving or parking violations issued by law enforcement
    b. Commercial motor vehicle driver "Out of Service" (OOS) violations issued by motor vehicle enforcement officials
    c. Violations for vehicle being out of service, over weight, over height or over length issued by the DMV.

Work zone safety

1. Follow state and local regulations for establishing safe work zones.

Office Safety

1. All desk and cabinet drawers shall be closed when not in use.
2. Only one file drawer shall be open in a cabinet at any one time.
3. Place heaviest loads in lower drawers or shelves to avoid "top loading."
4. Objects that present a hazard shall not be stored on top of cabinets or other storage enclosures.
5. Paper cutter blades shall be down and secured when not in use.
6. Electrically powered office equipment shall be operated in accordance with manufacturer's instructions.
7. When using power strips, follow manufacturer's recommendations. Do not overload outlets. Avoid connecting multiple power strips in series.
8. Keep combustibles to a minimum. Do not store combustible material, such as paper, in close proximity to electrical outlets and connections.
9. Use office chairs appropriately to avoid tipping. Do not tilt chairs such that they could tip over.
10. Do not stand on chairs, desks or tables. Use appropriate step stools or ladders.
11. Use handrails when available.
12. Do not use portable space heaters without prior approval from your supervisor and site/facilities management. 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.
13. Avoid distractions while walking in office areas such as using cellphones, reading materials, etc.

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 cleanup is expected to last.
3. If cleaning paint chips is expected to take more than 15 minutes, contact your H&S/EHS professional.
4. If cleanup 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 at crosswalks and obey crossing signals.
2. Look for oncoming vehicles and cyclists in both directions.
3. Do not text or talk on a cellphone when crossing the street. Take your time.
4. Make eye contact with approaching drivers and wait for them to acknowledge you before you cross in front of a turning vehicle.
5. Stop in parking garages and wait for oncoming traffic.
6. Provide feedback to individuals who do not practice these behaviors.

Personal Protective Equipment

General

1. Workers shall be instructed in the proper use, care and inspection of personal protective equipment (PPE).
2. Workers shall maintain PPE in a sanitary and reliable condition.
3. Workers shall inspect PPE prior to use and immediately following any incident that could have caused damage.
4. Damaged PPE shall not be used.
5. Workers shall adhere to manufacturer's recommendations for personal protective equipment.
6. A hazard assessment must be performed before PPE is issued or used in order to assure 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.
2. Minimum eye protection shall consist of safety glasses with side shields. Side shields must meet applicable standards for quality, durability and protective ability.
3. When face shields are used, safety glasses with side shields or equivalent must be worn beneath the face shield.
4. Goggles or other tight-fitting eyewear (i.e., spoggles) that creates a seal around the eyes shall be worn when safety glasses with side shields will not provide adequate protection.
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. Welders and helpers (e.g., fire watch) 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).
7. 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.

Head protection

1. Hard hats and suspensions should be replaced periodically.
2. Head protection is required when workers are exposed to injury due to falling objects, electric shock, burns or other head injury hazards.
3. Hard hats or helmets must meet or exceed acceptable standards such as ANSI Z89.1.
4. Where electrical hazards are present, hard hats must be nonconductive and meet requirements for Class E (up to 20 kV).

Foot protection

1. ANSI/ASTM-rated protective footwear (safety boots or shoes) shall be worn where there is danger of foot injury from falling and rolling objects or from objects that might pierce the foot.
2. Safety boots/shoes shall 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.
3. Wear protective footwear as required by business unit procedures.

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 nontoxic materials, as well as while operating machinery or handling materials.
2. When protection is needed from cuts and punctures, ensure gloves with the proper cut and puncture resistance are selected and used.
3. Consult with H&S/EHS professional for assistance in selecting proper hand protection.

Clothing/body protection

1. Protective clothing shall be used when 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 or exposure to hazardous materials in an emergency response action.
2. Don and doff protective clothing in a manner that prevents contaminating your body. Dispose of contaminated clothing properly.

Traffic vests/rain gear

1. A minimum of Class 2 traffic vest/rain gear shall be worn while working on the ground within the road right of way or any other work location where visibility of worker is needed for protection.
2. Class 3 traffic vest/rain gear is required when flagging traffic within the road right of way. Class 2 traffic vest/rain gear is acceptable for flagging traffic inside company-controlled access zones not related to public roads.
3. Workers shall remove reflective vests/rain gear when there is potential for them to be exposed to an arc, flash or contact, unless the vest/rain gear is FR-rated.

Powered Industrial Trucks

1. Powered industrial trucks shall be operated in accordance with manufacturer's recommendations.
2. Only trained and authorized operators shall be permitted to operate a power lift truck.
3. Powered industrial trucks shall be inspected before being placed in service each day or before each shift. Document inspection.
4. A powered industrial truck shall not be used when deficiencies are found. The truck shall be repaired before it is placed back into service.
5. The rated capacity shall not be exceeded. When these vehicles are equipped with supports, they shall be utilized to prevent tipping.
6. When the powered industrial truck is parked or left unattended, the operator shall place the forks flat on the floor, neutralize controls, turn off the engine, set hand brake and remove/secure the key to prevent unauthorized use.
7. While loading or unloading material, forks may be left in the raised position if there is an ergonomic concern and precautions have been discussed as part of the pre-job briefing.
8. The operator may leave the seat of a parked and running powered industrial truck only if:
    a. the operator is in line of sight
    b. the operator is within 25 feet of the controls
    c. the powered industrial truck is secured
    d. the forks are flat on the floor
    e. the controls are neutralized
    f. the hand brake is set
9. The operator shall be in the driver's seat while operating a powered industrial truck.
10. Modifications shall not be made without written approval from the manufacturer.

11. Attachments must be considered as part of the load and used in accordance with manufacturer's recommendation.
12. Free-rigging (suspending load from the tines with a sling) is prohibited.
13. Operator shall not allow anyone to stand or pass under the elevated portion of any powered industrial truck.
14. The operator shall not descend a ramp or grade with the load in front.
15. Only the driver shall ride on the powered industrial truck, unless an additional seat is provided.
16. Powered industrial truck operators and passengers shall wear seat belts where provided.
17. The operator of an order picker or high-lift rider truck shall wear approved fall protection and lanyard. The lanyard shall be attached to an approved overhead member of the platform at a point located above and near the center of the platform.
18. When forward view is obstructed, the driver shall travel with the load trailing or get assistance.
19. Operators shall properly stack and balance loads for transporting.
20. Operators shall travel with forks or load as close to the ground as possible and spread the forks for proper balance and stability of load.
21. Arms, legs and feet shall remain inside the powered industrial truck when moving.
22. Hands and arms shall not be extended through openings in the mast area.
23. The charger shall be turned off before connecting or disconnecting from an electric powered industrial truck.
24. Before driving or operating a powered industrial truck inside or on a truck or trailer, those trucks or trailers shall be secured and wheels chocked.
25. Travel speeds shall be dictated by surface conditions.
26. The horn shall be sounded before going through doorways or around blind corners.
27. Plan routes to avoid hazards of overhead power lines. Use spotters when necessary.

Pressurized Equipment

1. Before dismantling valves, flanges, access covers and similar apparatus associated with boilers, pressure vessels or pressure piping, the pressure shall be relieved and the equipment adequately drained. Follow lockout/tagout and line-breaking procedures as appropriate.
2. When an access cover to a pressurized system is bolted into place, a minimum of two loosened bolts should be left in the cover prior to breaking the seal. Additional bolts may be required based on expected pressures and shock load. When possible, the bolts shall be opposing.

Preventing Slips, Trips and Falls on Same Level

1. To avoid slips, trips and falls on same level, workers should consider these best practices:
   a. When walking, workers should identify all pathway hazards and take the necessary precautions to avoid injuries associated with overhead obstacles and slip and trip hazards. These hazards may include: shelving, awnings, limbs, thresholds, floor matting, uneven ground, elevated curbing, and icy or wet surfaces.
   b. Wear footwear that is in good condition and correct for the situation. Consider using high-traction footwear on icy surfaces where appropriate.
   c. At building entrances, where provided, use adequate means to clean water/snow/debris from shoes.
   d. When on potentially slick surfaces, slow down, take shorter steps and keep center of gravity within stride.
   e. Keep walking surfaces clean. Address spills immediately.
   f. Do not walk with an obstructed view.
   g. On stairs, hold handrails where available.
   h. Avoid multitasking while walking. This includes reading materials and reading, dialing or texting on cellphones or other mobile devices.

Radio Frequency Devices and Exposure

Exposure

1. Radio frequency (RF) exposures from cellphone antennas on transmission towers, antennas on rooftops, wireless devices on distribution poles and other devices shall be evaluated and communicated to exposed workers.
2. Workers shall obey all posted signs, assume all antennas are active and maintain safe distance from all antennas.

Wireless devices and antennas on poles and streetlights

1. The following procedures shall be followed when working on or around distribution or streetlight poles with antennas or wireless equipment attached:
    a. Look for signage related to "Radio Frequency Exposure."
    b. Where no signage or a blue "Notice" signage exists, workers may work without restrictions.
    c. Where yellow "Caution" or red "Warning" signage exists, workers shall:
        i. Turn off the power to the wireless devices at the disconnect switch.
        ii. Complete all work on the pole.
        iii. Turn on the power to the wireless device at the disconnect switch.

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 workers shall be on site when anyone is on a tower.
    c. At least two workers trained in first aid/CPR shall be on site.
    d. Workers shall inspect base of tower prior to climbing.

e. Complete Communication Tower Daily Safety Checklist initially and every day work is performed (required by North Carolina OSHA only).

f. Fall protection is required at heights above 4 feet.

2. Before beginning work on a transmission tower with cellphone antennas or microwave devices, workers 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. Workers 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 workers spending extended periods of time in the area. Momentary passage through an area, as would be the case of a worker climbing a tower, has been determined to be safe.

Panel antennas

Maintain a 6-foot working distance from the front of panel antennas. Being less than 6 feet from the side, bottom, top and back of the antennas is not a hazard.

Omni directional vertical antennas

Maintain a 4-foot 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. Workers are not to access areas within 10 feet 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 Telecommunications Department.

4. If antennas are on the tower assume a yellow RF Caution environment exists 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

1. Obey all signs and barricades. Contact Duke Energy Telecommunications Department for assistance.

Radio use in generating facilities

1. 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. Radiation restricted areas must be established by the radiographer before exposing the radiation source.
2. 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 includes non-English speaking persons.
3. Only authorized individuals are permitted inside established radiation restricted areas.
4. Authorized individuals entering radiation restricted areas must be appropriately trained and have personnel radiation dosimeters (e.g., film badges, alarming rate meters).

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 training and medical clearance.
4. Any time a respirator is worn, the wearer must be free of facial hair between the respirator sealing surface and the face or any that may interfere with valve function.
5. The user must inspect respirator before use.
6. The user must perform positive and/or negative pressure fit checks each time the respirator is put on, to verify proper fit and operation.
7. The user must exit the contaminated work area and remove respirator if it malfunctions or any breathing difficulty occurs, or they can taste or smell any contaminant.
8. Do not leave respirators unprotected in contaminated work areas during breaks or intermittent work.
9. The user must be familiar with proper care and cleaning requirements for the type of respirator being used.
10. Store the respirator in a sealed plastic bag.
11. Do not store respirators on their sealing surface. This may distort the face mask.
12. Where appropriate, the worker must return issued respirators to the designated collection point after each use for proper cleaning, inspection, maintenance and storage.
13. Employees must only use company-approved respiratory protection.

14. The employee will notify his or her supervisor, an H&S/EHS professional or management of medical changes or concerns when wearing respiratory equipment.
15. Follow appropriate instructions for voluntary use of disposable respirators where it has been determined that no respiratory hazard exists.
16. Provide suggestions, feedback and concerns about the respirator program or your respirator to your supervisor or H&S/EHS professional.

Safety Signs and Barricades

1. Make safety signs readily visible at all times when a hazard exists.
2. Use safety signs that can withstand the environment.
3. Use red "Danger" tape and signs to warn of immediate hazards. Locate tape and signs at such distance from the hazard that persons cannot accidentally come into contact with the hazard.
4. Use yellow "Caution" tape and signs to designate potential hazard areas. Locate tape and signs so as to restrict access into the area.
5. When using warning tape or signs 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 and/or signs when the hazardous 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. Workers who perform work from and who erect or disassemble scaffolds shall be trained.
2. Inspect all scaffolds before use or at the start of each work shift. Pay attention to footing, planking, guardrails, mesh, connections, weld, rust, ladder condition or other access means.
3. After significant events that could affect a scaffold's structural integrity, re-inspect the scaffold.
4. Read and follow instructions on scaffold tags.
5. Use personal fall arrest equipment on supported scaffold platforms higher than 6 feet if guardrails are not installed.
6. Use personal fall arrest equipment and a guardrail system on single-point and two-point adjustable suspension scaffolds.
7. Use personal fall arrest equipment on boatswain's chairs, catenary scaffolds, float scaffolds, needle beam scaffolds and ladder jack scaffolds.
8. 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 or equivalent.
    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.
9. Do not use a defective scaffold. Assure a WARNING, DO NOT USE tag is put on a faulty scaffold until it is repaired.
10. Use the access provided with the scaffold.
11. Do not accumulate too many tools, materials and debris on the scaffold or overload it beyond the rated capacity.
12. Do not stand on or lay tools, materials and equipment on any scaffold railing.
13. To prevent tipping, do not load a scaffold unevenly.

14. During high winds and storms, do not work on an outside scaffold.
15. Do not work on an ice-coated scaffold.
16. Assure mobile scaffolds rest on a solid level footing.
17. If wheels or casters are provided, lock them to prevent accidental movement on scaffolds.
18. When asked to move mobile scaffolds:
    a. Get help so the pressure of pushing is not concentrated in one point on the scaffold.
    b. Assure scaffold will move across level floors that are also free of obstructions and openings.
    c. Apply force close to (5 feet or less) the base of the scaffold.
19. 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.
    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.
20. 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.
21. Before performing work from a scaffold, identify and safeguard any electrical hazards.
22. When moving mobile scaffolding, avoid obstructions including piping equipment, instrumentation, electrical lines, etc.
23. Keep the scaffold's working surface clean and organized at all times.

24. When the job is completed, remove all items from the scaffold.
25. 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. For lines under 300 V – 3 feet
    b. For lines over 300 V under 50 kV – 10 feet
    c. For lines over 50 kV – 10 feet plus 4 inches for every 10 kV over 50 kV
26. Do not use the frame on welded tubular frame supported scaffolds to access upper levels unless the distance between the integral rungs is 16 ¾ inches or less and the rungs are uniformly spaced. Otherwise, use an extension or hook-on ladder.
27. 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.
28. Use ladders on scaffolds to increase working level height of workers only on large-area scaffolds.
29. On suspension scaffolds 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 one-third of the original diameter of the outside wires.
    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.

30. Assure that wire rope clips on suspension scaffolds are inspected and retightened to the manufacturer's specifications at the start of each work shift.
31. Assure the wire ropes on suspension scaffolds are shielded, treated to resist corrosive substances or made of material that is not adversely affected by the substance being used when acids and other corrosive substances are used.
32. Shield suspension ropes when performing a heat-producing process.
33. 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. Assure 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.

Telecommunications Hazards

1. Optical fibers shall never be examined with the naked eye.
2. Ultraviolet-curing lamps shall only be used in designated holders. Special ultraviolet-proof glasses shall be worn when it is necessary to examine energized lamps.
3. When splicing optical ground wire (OPGW) cable, the cable shall be grounded to the transmission structure ground.
4. Bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating materials.
5. Rubber matting and appropriate rubber gloves with glove protectors shall be used when working on the telephone company side of the high-voltage isolation equipment.
6. Fiber-optic splicing glass shards shall be removed from worksites daily.

Tools

General

1. Work only with safe, approved tools and equipment properly suited for the job. Use tools in accordance with manufacturer's recommendations.
2. Modification and fabrication of tools and equipment shall be made only if approved. Consult engineering and business unit-specific procedures as appropriate.
3. Inspect tools before use.
4. Handle tools so that contact with exposed energized conductors is avoided.
5. Use proper tools for aligning bolt holes. Remove bolts or rivets in a controlled manner that will prevent injury or damage.
6. Do not tamper with safety switches. Do not modify, tape, bypass or otherwise defeat critical safety functions of devices including dead man switches and other safety switches.

Grinders

1. Use proper personal protective equipment. Utilize manufacturer's safeguards.
2. Portable grinders shall be equipped with constant pressure control switches.
3. Keep grinding wheels properly dressed and turning true. Use the correct grinding wheel.
4. Inspect grinding wheels before use.
5. Immediately before mounting, all wheels shall be closely inspected and sounded by the user (ring test) to make sure they have not been damaged.
6. Secure bench grinders properly. Adjust work rest to within $\frac{1}{8}$ inch to the grinding wheel. Adjust tongue guard to no more than $\frac{1}{4}$ inch between wheel and guard.
7. Drills, grinders and sanders shall not be placed on work surfaces or handed to another worker until the equipment has stopped rotating.

Chain saws

1. Follow manufacturer's instructions for operation and adjustment.
2. Wear PPE including hard hat, goggles or face shield with safety glasses, hearing protection, hand protection and foot protection.
3. Wear leg protection (chaps) when using a chain saw while standing on the ground. Does not apply to pole saws.
4. Chain saws, when not in use, shall be properly protected with a blade guard or case.
5. Gasoline powered chain saws shall be equipped with a continuous pressure throttle control system that will stop the chain when pressure on the throttle is released.
6. The chain saw shall be started with the chain brake engaged.
7. Chain saw shall not be operated with one hand.
8. Do not cut any material other than wood.
9. Ensure that the chain saw chain does not contact any obstruction such as other logs or branches, rocks, fencing, nails or spikes.
10. Avoid contact of the bar tip with any object to reduce kick-back hazards.
11. The chain saw shall be started at least 10 feet from the fueling area.

Hand tools

1. Keep knives and other cutting tools properly stored when not in use. When using knives and cutting tools, use proper hand protection and avoid drawing the knife/cutting tool toward you or others.
2. Tools with sharp edges should have guards when stored or in transit to work locations.
3. When using a screwdriver or any tool with puncture capability, do not hold work in the hand in such a manner that slipping will cause injury.
4. Tools shall not be painted, taped or modified in any way that would prohibit inspection for visual cracks or defects.

5. Coverings on the handles of tools shall not be considered as electrical insulation or as a substitute for voltage-rated gloves.
6. Chisels, punches, drifts and similar tools shall be kept free of mushroomed heads to prevent flying fragments.
7. Nonconductive measuring devices shall be used when taking measurements on or near exposed energized electrical conductors or equipment.
8. Handles shall be installed on files and rasps before use.
9. Open-end wrenches shall be used with force in the proper direction. Do not overload wrenches by using extensions. Ensure good footing when using wrenches to prevent slipping.
10. When using a striking face (slugging) wrench, use caution. The wrench, when being struck by a hammer, shall not be held by the hand or foot. Use a properly tied rope or other practical means to secure the wrench.
11. Do not throw tools between other workers or locations. Use a tool bucket or other suitable container and handline to raise or lower tools between elevations.
12. Use diagonal or side cutters or other suitable tool to cut tie wraps.

Transmission Substation/Switchyard Entry Requirements

This section applies to all Duke Energy employees and contractors. It defines requirements for entry into Duke Energy substations and switchyards.

Personal Protective Equipment

1. Clothing
   a. It is required that all individuals wear 100 percent natural fiber clothing to enter the substation.
   b. Long-sleeve flame-resistant (FR) shirt and pants must be worn when performing work on energized substation equipment or when within 10 feet of exposed energized substation equipment.
2. Hard Hats
   a. Hard hats shall be worn at all times inside a substation.
   b. Hard hats may be removed inside a control enclosure (i.e., control house, work trailer, etc.) when there is no exposure to injury due to falling objects, electric shock, burns or other head injury hazards.
3. Safety Shoes
   a. Safety shoes must be worn at all times inside a substation.
   b. Acceptable safety shoes must, at a minimum:
      - Have a safety toe
      - Provide ankle protection and support
      - Have electrical hazard (EH) rated soles
      - Have substantial uppers made of leather (or equivalent)
      - Cover the entire foot, with no openings
      - Have slip-resistant soles

Approved safety shoes must meet the requirements associated with ASTM F-2413, "Standard Specification for Performance Requirements for Protective Footwear."

4. Eye Wear
    a. Eye protection shall be worn at all times when inside a substation.
    b. When inside the control enclosure eye protection may be removed as long as there is no hazard due to particles, fumes, liquids, gases or radiation that could injure the eyes.
5. Additional PPE could be required depending upon the tasks to be performed and may include such items as gloves, traffic vests or face protection.

Jewelry

1. All persons entering a substation shall remove all jewelry prior to entry. This includes, but is not limited to: finger rings, necklaces, earrings, body piercings, chains, wrist bands, wrist watches, key rings/chains, metal or plastic bracelets or studs.
2. Prescription safety glasses with side shields and MedicAlert necklaces, bracelets and shoe tags are not considered jewelry and are exempt from this requirement but must be secured to prevent potential contact, flash or catching hazards.
    a. MedicAlert necklaces and bracelets shall be worn under FR clothing or rubber protective gloves if working on energized conductors or other energized equipment.

Training/Escort

1. Individuals requesting unescorted physical access to substations and/or switchyards must complete the required Substation Entry Training provided in that region. However, training alone should not be relied

upon as the sole determination that an individual understands the hazards that exist within a substation but is one prerequisite to granting unescorted access.

a. Qualified persons that have Substation Entry Training as part of their job qualifications and routine training are exempt from this requirement.

b. Training completion must be able to be verified through MyTraining Learning Management System (LMS) by having course code HS0005E (Basic Substation Entry; Computer Based Training) or COT329E (Substation Entry Guidelines; Instructor Led Training) completed.

c. Contracted companies shall ensure all employees/subcontractors who require unescorted entry to substations are trained to comply with OSHA 1910.269(a)(2)(i) and (ii) and supply documentation upon request.

2. Site-specific training may also be required for certain generation sites, customer sites or other specialized sites. Always check with local management for additional training or entry qualification prior to arriving on site.

3. Individuals that do not meet the training and experience requirements for unescorted access shall be permitted on site as long as they are escorted by a qualified individual during the duration of their visit.

NERC Critical Infrastructure Protection (CIP) Qualifications

1. Individuals requesting unescorted physical access to a Physical Security Perimeter (PSP) at a medium-impact NERC CIP designated substation facility must have successfully completed the following:

   a. NERC CIP Awareness training within the previous 12 months (see details below)

   b. A Personnel Risk Assessment (PRA) within the previous seven years
   c. Requested and been granted access to the desired location

2. Physical access requires the following NERC CIP Awareness courses be completed in MyTraining Learning Management System (LMS) within the previous 12 months:
   a. CIP2015 – NERC CIP Program Basics
   b. CIPPS2015 – NERC CIP Physical Security

Note that additional training may be required for additional access levels.

3. Individuals who have not completed the above requirements must be escorted at all times by an individual that has completed the above requirements.
4. A PSP at a substation or switchyard is typically, but not always, defined as the control enclosure within the station and not the yard itself.

Notification of Arrival/Departure

Individuals are required to immediately notify an employee-in-charge (EIC) upon arrival and departure if other work is taking place at the substation. Individuals should consult the EIC regarding other work taking place in the substation and review the pre-job briefs (PJB) of the other work taking place to ensure understanding of all work taking place and potential impact to the work or task being completed by the individual or group arriving on the site.

1. Upon arrival, if no other group is already on site, the EIC of the group shall hang a sign on the entry gate that indicates the EIC name and contact number in order to alert future individuals arriving on site that there are already individuals working on the site.
2. Individuals are required to provide notification to the appropriate control centers immediately upon arrival at a site as well as immediately upon departure from the same site through the Substation Integrated Voice Response (IVR) system. The IVR system can be reached by dialing

1-800-820-9365. Note: This does not replace the requirement for additional contacts that may be needed for coordination of work with any Transmission Control Center, Distribution Control Center, Plant Control Room, or other operating authority.

3. Specific locations may have additional site-specific procedures for arrival and departure such as local alarms that may need to be disabled/ enabled upon arrival/departure.

Pre-Job Brief

1. A documented pre-job brief (PJB) shall be conducted upon arriving at a site, and prior to any work being performed, which discusses the job tasks to be performed as well as the associated hazards and methods to mitigate such hazards. The PJB is typically led by the employee-in-charge (EIC) or designated crew member but should be an interactive discussion with all parties involved.
2. For groups or individuals that arrive on a site where others are working, the EIC on the site should be immediately notified and they should review the initial PJB with the arriving individual(s). An additional PJB should then be conducted to review task specific actions and hazards for the arriving individual(s).
3. Transmission employees are required to perform a written PJB even if they are lone workers or not performing any hands-on work (i.e., site tour, visual inspection, etc.) in order to ensure a thorough PJB is performed, the task(s) being performed are clearly understood and all applicable hazards are appropriately identified and mitigated.

Vehicle Movement

1. Upon entering the gate of any substation, a travel plan discussion must be initiated. If the substation is occupied, notification to the lead person must be made upon entry. The travel plan discussion must include the proposed drive path, the vehicle positioning plan, and the obstacles to maneuver. Only vehicles needed for the job task should enter the substation.

2. A 360-degree view of all sides, front and back, over and under, of the vehicle shall be made just prior to vehicle movement.
3. A vehicle guide shall be used when available if vehicle is operated within 10 feet of any device within the substation fence. Backing should be avoided unless:
   a. It is the safest option
   b. All hazards are identified and avoided while backing
   c. The vehicle is operated at a safe speed.

When backing, all applicable company rules must be followed.

4. A maximum travel speed of 10 mph shall be observed.

Trenching and Excavations

1. Locate underground utilities prior to soil disturbance. Where appropriate, contact utility locating services. Examples include digging, trenching, excavating, post hole digging, drilling, augering, pile driving, grading, etc.
2. Assure a trench and excavation permit is completed prior to trench and excavation activities. Business units may have equivalent alternatives.
3. No worker shall enter a trench or excavation deeper than 5 feet unless it has been inspected by a competent person.
4. 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.
5. 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.
6. 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.
7. Workers who are exposed to vehicular traffic must wear high-visibility vests or other garments.
8. Workers shall not work under loads handled by lifting or digging equipment.
9. 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.
10. Atmospheric testing is required where oxygen deficiency (less than 19.5 percent oxygen) or a hazardous atmosphere could exist.

11. When ventilation is used to reduce the level of atmospheric contaminants to an acceptable level, testing must be conducted as often as necessary to assure continuing safety.
12. Emergency rescue equipment must be readily available where hazardous atmospheric conditions exist or can reasonably be expected to develop.
13. Workers must be protected when working in excavations where water has accumulated or is accumulating.
14. 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.
15. 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.
16. 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.
17. To keep soil piles from falling into the trench, clear edges of excavations back to at least 2 feet.
18. Provide walkways where workers or equipment are permitted to cross over excavations. Use guardrails where walkways are 6 feet or more above lower levels.
19. Barricade open, unattended excavations.

Vegetation Management

General

Vegetation management contractors shall comply with applicable OSHA standards and with ANSI Z133, 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 worker 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, radios)
    c. The work area including the drop zone(s)

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 chain saws 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 require repeat-back.

Water Safety

Working over or near water

1. Workers working over or near water, where the danger of drowning exists, shall be provided with U.S. Coast Guard-approved personal flotation devices (PFD).
2. When fall protection is used and will prevent persons from falling into water, personal flotation device is not required.
3. Prior to and after each use, personal flotation devices shall be inspected for defects that would alter their strength or buoyancy. Defective units shall not be used.
4. Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
5. At least one lifesaving skiff shall be immediately available at locations where workers are working over or adjacent to water.

Working on watercraft/boats

1. When in a watercraft, wear Coast Guard-approved personal flotation devices.
2. Prior to and after each use, the personal flotation devices shall be inspected for defects that would alter their strength or buoyancy. Defective units shall not be used.
3. Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
4. At least one lifesaving skiff shall be immediately available at locations where workers are working over or adjacent to water.
5. Assure operators have demonstrated skills and/or training to operate watercraft safely.
6. Assure all watercraft meet U.S. Coast Guard requirements.

7. Assure watercraft longer than 16 feet are equipped with a Coast Guard-approved throwable personal flotation device.

Working on 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. Assure availability of a Coast Guard-approved 30-inch life ring with 90 feet 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, assure fire extinguishers are readily available.
4. Assure safe access/egress to/from barge.
5. Assure handrails are installed unless their presence is a more significant safety hazard.
6. Assure all barge connections are in place before operation (e.g., barge-to-barge, spud wells-to-barge and anchorage).
7. Assure 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. Assure 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

1. For diving requirements, see OSHA 29CFR 1910 Subpart T, Commercial Diving Operations.

Welding and Thermal Cutting – Health Exposures

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. 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.
5. When using welding screens around your work, arrange screens so that restrictions to ventilation are minimized.
6. Position the exhaust system take-off near enough to the electrode to assure maximum fume capture when using local exhaust ventilation.
7. Do not use oxygen for ventilation purposes.
8. Where ventilation or natural conditions do not control welding/cutting fumes from reaching the workers' breathing zones, use appropriate respirators.
9. 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 inches. If coating removal is not possible, use ventilation and/or respiratory protection.
10. Prior to removing or disposing of coating materials, determine if the coating contains lead or hexavalent chromium. See your location H&S/ EHS professional for guidance.
11. Before applying heat, verify that metal is clean of any solvents (particularly chlorinated solvents), oils or other materials that may cause hazardous decomposition products.

12. Do not perform welding or thermal cutting activities within 200 feet of the storage of chlorinated solvents.
13. Discuss potential fume hazards in the pre-job brief. Review product SDS and/or hazard label, ventilation options and PPE. Coordinate with H&S/ EHS professional to determine if adequate exposure assessments have been completed for the specific activity.

Duke Energy | 550 South Tryon Street | Charlotte, NC 28202

DUKE ENERGY

nactive Worker Report

Vorker Data Sheet for:	Trapp,Nathaniel J. - 274474	**Home Address Line 1:**	3703 Walnut Park Drive
Birth Date | Age:	05/29/1985 - 31	**Home Address Line 2:**	
Gender:	Male	**Home Address City:**	Alexandria
Ethnicity:	White	**Home Address State:**	Kentucky
		Home Address Postal:	41001
		Phone Number:	

Vorker Record(s)

Concurrent Record Number:	0
Vorker Status Name:	Terminated
Hire Date:	09/22/2008
Service Date:	09/22/2008
Last Hire Date:	09/22/2008
Last Date Worked:	04/03/2015
Termination Date:	11/23/2015

Training History

lote: Training records are from 1995 to present and include Nuclear activities from December 15, 1996 to present, additionally Piedmont workers data may not be available on this report. Contact HRReporting if there are questions.

Status Date	Training Activity Code	Training Activity Name	Training Activity Type	Registration Status	Completion Status	Pass (Y/N)	Estimated Credit Hours	Actual Hours
6/16/2015	HS2125 2015MW	Smith System Driver Practical	ILT Class	Cancelled				0.00
6/16/2015	HS2124 2015MW	Smith System Driver Classroom	ILT Class	Cancelled				0.00
3/5/2015	COT410	Work Method Rollout Acceptance	ILT Course	Attended	Y	Y		0.00
3/5/2015	COT410 MW	Offering of Work Method Rollout Acceptance	ILT Class	Completed	Y	Y		0.00
2/18/2015	HS0276	CPR / AED/ First Aid	ILT Course	Attended	Y	Y	0.00	0.00
2/18/2015	HS0277	CPR /AED/ First Aid Refresher	ILT Course	Attended	Y	Y	0.00	0.00
2/18/2015	HS0277 2015MW	EHS-CPR & First Aid Refresher	ILT Class	Completed	Y	Y		0.00
1/22/2015	COT343AA	Personal Protective Grounding in Substations Course Manager Documentation	ILT Course	Attended	Y	Y		0.00
1/22/2015	COT343AA 2015MW	Personal Protective Grounding in Substations Course Manager Documentation (1/1/2015-12/31/2015)	ILT Class	Completed	Y	Y		0.00
1/22/2015	COT343A	Personal Protective Grounding in Substations	ILT Course	Attended	Y	Y		0.00
1/22/2015	COT343A 024MW	Personal Protective Grounding in Substations	ILT Class	Completed	Y	Y		0.00
1/22/2015	COT343A	Personal Protective Grounding in Substations	ILT Course	Attended	Y	Y		0.00
1/22/2015	COT343A 2015MW	Personal Protective Grounding in Substations	ILT Class	Completed	Y	Y		0.00
1/10/2015	COT148C	Duke Energy Safe Driving	eLearning	Completed	Y	Y		0.51
1/10/2015	HSD001E	Work Zone Safety and Flagging	eLearning	Completed	Y	Y		0.06
1/10/2015	HS0455	Hot Work	eLearning	Completed	Y	Y		0.03
1/10/2015	HS9200	Welding and Thermal Cutting Hazards and Control	eLearning	Completed	Y	Y	1.00	0.03
1/10/2015	HS0446	Trenching and Excavations Safe Work Practices	eLearning	Completed	Y	Y		0.02
1/10/2015	EN0229	DOT Shipping Compressed Gas Cylinders (EN0229)	eLearning	Completed	Y	Y	0.00	0.17
1/10/2015	EN0234	DOT Shipping and Transporting SF6 (EN0234)	eLearning	Completed	Y	Y	0.00	0.21
1/10/2015	EN0315	Duke Energy DOT Security Plans (EN0315)	eLearning	Completed	Y	Y	0.00	0.07
1/10/2015	EN0220	DOT Loading & Unloading Hazardous Materials	eLearning	Completed	Y	Y	0.00	0.06

Status Date	Training Activity Code	Training Activity Name	Training Activity Type	Registration Status	Completion Status	Pass (Y/N)	Estimated Credit Hours	Actual Hours
1/9/2015	EN0213	DOT General Awareness, Safety and Security Awareness	eLearning	Completed	Y	Y		0.29
1/9/2015	PGL659	Duke Energy Midwest: System Restoration for Field Personnel	eLearning	Completed	Y	Y		0.20
1/9/2015	PGL353	Midwest System Operations Switching & Tagging	eLearning	Completed	Y	Y		0.27
1/9/2015	HS0217	EHS-Confined Space Entrant/Attend	eLearning	Completed	Y	Y		0.15
1/9/2015	EN0068	Migratory Bird Treaty Act (EN0068)	eLearning	Completed	Y	Y	0.00	0.02
1/9/2015	HS0088	Lead in Construction	eLearning	Completed	Y	Y		0.05
1/9/2015	HS0024	Hearing Conservation	eLearning	Completed	Y	Y		0.05
1/9/2015	TransEngComplFLDep	Department Directives	Objective	Attended	Y	Y		0.00
1/9/2015	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y	Y		0.04
1/9/2015	HS0701	Fire Extinguisher Annual Training - Non-Fire Brigade	ILT Course	Attended	Y	Y	0.00	0.00
1/9/2015	HS0702	Fire Extinguisher Annual Education	eLearning	Attended	Y	Y		0.00
1/9/2015	TransEngComplFLReg	Regulatory Compliance	Objective	Attended	Y	Y		0.00
1/9/2015	PDHS0555	Blood Borne Pathogens	eLearning	Completed	Y	Y		0.11
1/9/2015	HS0112	EHS-Basic Respiratory Protection	eLearning	Completed	Y	Y		0.10
1/9/2015	HS0246	Class IV Asbestos Refresher	eLearning	Completed	Y	Y		0.11
12/10/2014	EEP1401	Understanding the EPA's Proposed Clean Power Plan	eLearning	Completed	Y	Y		0.14
12/2/2014	CIP2014	NERC Cyber Security Awareness	eLearning	Completed	Y	Y		0.11
9/9/2014	COT405	Avoiding Fatigued Driving	Document	Cancelled				0.00
9/9/2014	HS2125	Smith System Driver Practical	ILT Course	Attended	Y	Y		0.00
9/9/2014	HS2125 000146	Smith System Driver Practical 2014 MW	ILT Class	Completed	Y	Y		0.00
9/9/2014	COT148C	Duke Energy Safe Driving	eLearning	Attended	Y	Y		0.00
9/9/2014	HS2124	Smith System Driver Classroom	ILT Course	Attended	Y	Y		0.00
9/9/2014	HS2124 000172	Smith System Driver Classroom 2014 MW	ILT Class	Completed	Y	Y		0.00
9/9/2014	HS2125	Smith System Driver Practical	ILT Course	Attended	Y	Y		0.00
9/9/2014	HR0113	Maintaining a Harassment-Free Workplace for Employees	eLearning	Completed	Y			0.15
9/9/2014	HR0411	Social Media Practices & Pointers	eLearning	Completed	Y			0.14
8/6/2014	EC22014	NERC Awareness Training	eLearning	Completed	Y			0.05
8/6/2014	EC10614	Code of Business Ethics Refresher 2014	eLearning	Completed	Y			0.10
8/6/2014	EC50214	Records Information Management Compliance	eLearning	Completed	Y			0.07
7/1/2014	EC10614	Code of Business Ethics Refresher 2014	eLearning	Completed	Y			0.09
3/18/2014	HPTR301	HP Tool Utilization-Module 1	ILT Course	Attended	Y	Y		0.00
3/18/2014	HPTR301 0001	HP Tool Utilization-Module 1	ILT Class	Completed	Y	Y		0.00
3/10/2014	PDHS0520	OSHA 1910.269 Signed Acknowledgements	ILT Course	Attended	Y	Y	1.00	0.00
3/10/2014	PDHS0520 112014	OSHA 1910.269 Signed Acknowledgements	ILT Class	Completed	Y	Y		0.00
2/24/2014	HS0152	EHS-Non-Nuclear Resp Fit Test	ILT Course	Attended	Y	Y	0.00	0.00
2/24/2014	HS0152 22414MW	EHS-Non-Nuclear Resp Fit Test	ILT Class	Completed	Y	Y		0.00
2/11/2014	LDIT049	Duke Energy's Top Ten IT Security Risks Video	eLearning	Completed	Y			0.09
1/8/2014	EN0068	Migratory Bird Treaty Act (EN0068)	eLearning	Completed	Y	Y	0.00	0.05
1/8/2014	HS0217	EHS-Confined Space Entrant/Attend	eLearning	Completed	Y	Y		0.15
1/8/2014	HSC008E	Wood Pole Inspection	eLearning	Completed	Y			0.09
1/8/2014	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y	Y		0.06
1/7/2014	HS0088	Lead in Construction	eLearning	Completed	Y	Y		0.07
1/7/2014	HS0246	Class IV Asbestos Refresher	eLearning	Completed	Y	Y		0.07
1/7/2014	HS0024	Hearing Conservation	eLearning	Completed	Y	Y		0.04
1/7/2014	EN0003	Hazard Communications - Revisions	eLearning	Completed	Y			0.06
1/7/2014	EN0002	Hazard Communication	eLearning	Completed	Y			0.07

Status Date	Training Activity Code	Training Activity Name	Training Activity Type	Registration Status	Completion Status	Pass (Y/N)	Estimated Credit Hours	Actual Hours
1/7/2014	EN0003	Hazard Communications - Revisions	eLearning	Attended	Y			0.00
1/7/2014	PDEAP01	Power Delivery Emergency Action Plans and Fire Prevention Plans	eLearning	Completed	Y			0.02
1/7/2014	HS0281	Electrical Safety Related Work Practices	eLearning	Completed	Y			0.02
1/7/2014	ENC005	Spill Prevention Control and Countermeasure Plans (SPCC) (ENC005)	eLearning	Completed	Y			0.02
1/7/2014	HS0112	EHS-Basic Respiratory Protection	eLearning	Completed	Y	Y		0.08
1/7/2014	HS0545	Bloodborne Pathogens	eLearning	Completed	Y			0.13
1/7/2014	EN0003	Hazard Communications - Revisions	eLearning	Completed	Y	Y		0.00
11/13/2013	CIP4R2	NERC Cyber Security Awareness 2013	eLearning	Completed	Y			0.09
10/15/2013	COT148C	Duke Energy Safe Driving	eLearning	Completed	Y	Y		0.32
10/4/2013	HS0900	FORKLIFT PERFORMANCE EVALUATION	ILT Course	Attended	Y	Y	0.00	0.00
10/4/2013	hs0900 9308	FORKLIFT PERFORMANCE EVAL	ILT Class	Completed	Y	Y		0.00
9/24/2013	EC22013	NERC Awareness Training	eLearning	Completed	Y			0.05
9/24/2013	EC22013	NERC Awareness Training	eLearning	Completed	Y	Y		0.00
7/20/2013	EC10613	CoBE Refresher Training 2013	eLearning	Completed	Y			0.05
7/20/2013	EN0003	Hazard Communications - Revisions	eLearning	Completed	Y			0.05
7/20/2013	LD325	Sustainability 101	eLearning	Completed	Y			0.17
3/12/2013	HS0152	EHS-Non-Nuclear Resp Fit Test	ILT Course	Attended	Y	Y	0.00	0.00
3/12/2013	HS0152 7701	EHS-Non-Nuclear Resp Fit Test	ILT Class	Completed	Y	Y		0.00
2/20/2013	HS0277	CPR /AED/ First Aid Refresher	ILT Course	Attended	Y	Y	0.00	0.00
2/20/2013	HS0277 1501	EHS-CPR & First Aid Refresher	ILT Class	Completed	Y	Y		0.00
2/20/2013	HS0545	Bloodborne Pathogens	eLearning	Attended	Y	Y		0.00
2/20/2013	HS0148	EHS-Automatic External Defibrillat	ILT Course	Attended	Y	Y	0.00	0.00
2/20/2013	HS0148 1501	EHS-Automatic External Defibrillat	ILT Class	Completed	Y	Y		0.00
2/14/2013	PGL659	Duke Energy Midwest: System Restoration for Field Personnel	eLearning	Completed	Y	Y		0.07
2/14/2013	PGL659	Duke Energy Midwest: System Restoration for Field Personnel	eLearning	Completed	Y	Y		0.07
1/10/2013	HS0545	Bloodborne Pathogens	eLearning	Completed	Y			0.11
1/10/2013	HS1003	Office Safety	eLearning	Completed	Y			0.08
1/10/2013	HS0112	EHS-Basic Respiratory Protection	eLearning	Completed	Y			0.07
1/10/2013	ENC005	Spill Prevention Control and Countermeasure Plans (SPCC) (ENC005)	eLearning	Completed	Y			0.02
1/10/2013	HS0281	Electrical Safety Related Work Practices	eLearning	Completed	Y			0.02
1/10/2013	PDEAP01	Power Delivery Emergency Action Plans and Fire Prevention Plans	eLearning	Completed	Y			0.01
1/10/2013	EN0002	Hazard Communication	eLearning	Completed	Y			0.04
1/10/2013	HS0024	Hearing Conservation	eLearning	Completed	Y			0.04
1/10/2013	HS0246	Class IV Asbestos Refresher	eLearning	Completed	Y			0.06
1/10/2013	HS0088	Lead in Construction	eLearning	Completed	Y			0.06
1/10/2013	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y			0.05
1/10/2013	HSC008E	Wood Pole Inspection	eLearning	Completed	Y			0.07
1/10/2013	HS0142	Supported and Non-Powered Suspended Scaffold User Training	eLearning	Completed	Y			0.06
1/10/2013	HS9054	Emergency Showers and Eyewash	eLearning	Completed	Y	Y		0.01
1/10/2013	HS0455	Hot Work	eLearning	Completed	Y	Y		0.03
1/10/2013	HS0446	Trenching and Excavations Safe Work Practices	eLearning	Completed	Y	Y		0.02
1/10/2013	PGL353	Midwest System Operations Switching & Tagging	eLearning	Completed	Y	Y		0.19
1/7/2013	PDHS0520	OSHA 1910.269 Signed Acknowledgements	ILT Course	Attended	Y	Y	1.00	0.00
1/7/2013	PDHS0520 9600	OSHA 1910.269 Signed Acknowledgements	ILT Class	Completed	Y	Y		0.00
1/7/2013	PDHS0520	OSHA 1910.269 Signed Acknowledgements	ILT Course	Attended	Y	Y	1.00	0.00
1/7/2013	PDHS0520 9000	Offering of OSHA 1910.269 Signed Acknowledgements	ILT Class	Completed	Y	Y		0.00

Status Date	Training Activity Code	Training Activity Name	Training Activity Type	Registration Status	Completion Status	Pass (Y/N)	Estimated Credit Hours	Actual Hours
12/9/2012	NERC2012	NERC Awareness Training	eLearning	Completed	Y			0.03
12/9/2012	NCS2012	NERC Cyber Security 2012/2013	eLearning	Completed	Y			0.04
12/9/2012	NERC2012	NERC Awareness Training	eLearning	Completed	Y			0.03
12/9/2012	NCS2012	NERC Cyber Security 2012/2013	eLearning	Completed	Y			0.07
9/26/2012	ENC005	Spill Prevention Control and Countermeasure Plans (SPCC) (ENC005)	eLearning	Attended	Y	Y		0.00
9/13/2012	EC10612	COBE Refresher 2012	eLearning	Completed	Y			0.11
8/30/2012	HS0008 4011	PD Tower Rescue Training/ Sub Ops	ILT Class	Completed	Y	Y		0.00
8/30/2012	PD-HS0008	PD Tower Rescue Training/ Sub Ops	ILT Course	Attended	Y	Y	2.00	0.00
8/30/2012	HS0006 4009	PD Manlift Rescue Training/ Sub Ops	ILT Class	Completed	Y	Y		0.00
8/30/2012	PD-HS0006	PD Manlift Rescue Training/ Sub Ops	ILT Course	Attended	Y	Y	1.00	0.00
8/30/2012	HS0422	Bucket Escape	ILT Course	Attended	Y	Y	0.00	0.00
8/30/2012	HS0422 4008	Bucket Escape	ILT Class	Completed	Y	Y		0.00
8/30/2012	HS0470	HS-Bucket Rescue	ILT Course	Attended	Y	Y	0.00	0.00
8/30/2012	HS0470 4007	HS-Bucket Rescue	ILT Class	Completed	Y	Y		0.00
8/30/2012	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y			0.04
7/18/2012	LDIT009	Information Security Awareness 2012 - Employee	eLearning	Completed	Y			0.06
3/15/2012	HS0900	FORKLIFT PERFORMANCE EVALUATION	ILT Course	Attended	Y	Y	0.00	0.00
3/15/2012	HS0900 12012	FORKLIFT PERFORMANCE EVAL HS0900 12012	ILT Class	Completed	Y	Y		0.00
3/1/2012	HS0453	CMV Pre-Trip/Post Trip Inspection (HS0453)	eLearning	Attended	Y	Y		0.00
3/1/2012	HS0461	Post-Trip & Pre-Trip Inspection	ILT Course	Attended	Y	Y	0.00	0.00
3/1/2012	HS0461 2002	Post-Trip & Pre-Trip Inspection	ILT Class	Completed	Y	Y		0.00
3/1/2012	HS0152	EHS-Non-Nuclear Resp Fit Test	ILT Course	Attended	Y	Y	0.00	0.00
3/1/2012	HS0152 12076	EHS-Non-Nuclear Resp Fit Test HS0152 12076	ILT Class	Completed	Y	Y		0.00
2/29/2012	PDHS0520	OSHA 1910.269 Signed Acknowledgements	ILT Course	Attended	Y	Y	1.00	0.00
2/29/2012	PDHS0520 1011	OSHA 1910.269 Signed Acknowledgements	ILT Class	Completed	Y	Y		0.00
2/24/2012	HS0360	Non-Nuclear Advanced respiratory Protection - SAR	ILT Course	Attended	Y	Y		0.00
2/24/2012	HS0360 12002	Non-Nuclear Advanced respiratory Protection - SAR HS0360 12002	ILT Class	Completed	Y	Y		0.00
2/21/2012	PDLOTO11	Midwest Transmission/Generation Lockout Tagout	ILT Course	Attended	Y	Y		0.00
2/21/2012	PDLOTO11 0003	Midwest Transmission/Generation Lockout Tagout	ILT Class	Completed	Y	Y		0.00
2/6/2012	SEC0001	NERC Personnel Risk Assessment	Document	Completed	Y	Y		0.00
1/31/2012	NCS2011	NERC Cyber Security Awareness 2011	eLearning	Completed	Y			0.20
1/31/2012	ITSECCUR01	Information Security Awareness 2011 – Employee Version	eLearning	Completed	Y			0.07
1/17/2012	HS9200	Welding and Thermal Cutting Hazards and Control	eLearning	Completed	Y		1.00	0.07
1/17/2012	HS9200	Welding and Thermal Cutting Hazards and Control	eLearning	Completed	Y	Y	1.00	0.07
1/17/2012	EN0228	DOT Materials of Trade (DE)	eLearning	Completed	Y			0.08
1/17/2012	EN0228	DOT Materials of Trade (DE)	eLearning	Completed	Y	Y		0.08
1/17/2012	EN0228	DOT Materials of Trade (DE)	eLearning	Completed	Y	Y		0.08
1/17/2012	EN0314	Hazardous Materials Security Awareness	eLearning	Completed	Y			0.04
1/17/2012	EN0314	Hazardous Materials Security Awareness	eLearning	Completed	Y	Y		0.04
1/17/2012	EN0350	DOT Emergency Response Guide Book Safety Training	eLearning	Completed	Y			0.52
1/17/2012	EN0350	DOT Emergency Response Guide Book Safety Training	eLearning	Completed	Y	Y		0.52
1/17/2012	EN0234	DOT Shipping and Transporting SF6 (EN0234)	eLearning	Completed	Y		0.00	0.17
1/17/2012	EN0234	DOT Shipping and Transporting SF6 (EN0234)	eLearning	Completed	Y	Y	0.00	0.17
1/17/2012	EN0240	DOT General Awareness	eLearning	Completed	Y			0.07
1/17/2012	EN0240	DOT General Awareness	eLearning	Completed	Y	Y		0.07
1/17/2012	EN0229	DOT Shipping Compressed Gas Cylinders (EN0229)	eLearning	Completed	Y	Y	0.00	0.23

Status Date	Training Activity Code	Training Activity Name	Training Activity Type	Registration Status	Completion Status	Pass (Y/N)	Estimated Credit Hours	Actual Hours
1/17/2012	HS9054	Emergency Showers and Eyewash	eLearning	Completed	Y			0.02
1/17/2012	PD-EN0068E	Migratory Birds - Power Delivery***INACTIVE****	eLearning	Completed	Y			0.06
1/17/2012	HSC008E	Wood Pole Inspection	eLearning	Completed	Y			0.11
1/17/2012	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y			0.07
1/17/2012	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y	Y		0.07
1/17/2012	HS0088	Lead in Construction	eLearning	Completed	Y			0.11
1/17/2012	HS0088	Lead in Construction	eLearning	Completed	Y	Y		0.11
1/17/2012	HS0246	Class IV Asbestos Refresher	eLearning	Completed	Y			0.12
1/17/2012	HS0246	Class IV Asbestos Refresher	eLearning	Completed	Y	Y		0.12
1/17/2012	EN0002	Hazard Communication	eLearning	Completed	Y			0.08
1/17/2012	EN0002	Hazard Communication	eLearning	Completed	Y	Y		0.08
1/17/2012	PDEAP01	Power Delivery Emergency Action Plans and Fire Prevention Plans	eLearning	Completed	Y			0.02
1/17/2012	HS0281	Electrical Safety Related Work Practices	eLearning	Completed	Y			0.03
1/17/2012	HS0112	EHS-Basic Respiratory Protection	eLearning	Completed	Y			0.12
1/17/2012	HS0545	Bloodborne Pathogens	eLearning	Completed	Y			0.15
1/17/2012	HS0545	Bloodborne Pathogens	eLearning	Completed	Y	Y		0.15
11/2/2011	HS0451	DOT Drug & Alcohol Testing Program for Employees with CDL's or Gas Pipeline Related Duties (HS0451)	eLearning	Completed	Y			0.22
7/27/2011	PD-HS0015	SMART GRID: Identification Training Course	ILT Course	Attended	Y			0.00
7/27/2011	PD-HS0015 MWCHARLESST072711	SMART GRID: Identification Training Course	ILT Class	Completed	Y			2.00
7/27/2011	PD-HS0015 MWSUBOPS072711	SMART GRID: Identification Training Course	ILT Class	Completed	Y			2.00
7/25/2011	EC10611	CoBE Refresher Training 2011	eLearning	Completed	Y			0.13
6/16/2011	PD-HS0006	PD Manlift Rescue Training/ Sub Ops	ILT Course	Attended	Y		1.00	0.00
6/16/2011	PDHS0006 MWSUBOPSAFWK061411	PD Manlift Rescue Training/ Sub Ops	ILT Class	Completed	Y			0.00
6/15/2011	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y	Y		0.00
6/15/2011	PD-HS0007	PD Transformer / Circuit Breaker Rescue Training	ILT Course	Attended	Y		1.00	0.00
6/15/2011	PD-HS0007 MWSUBOPSSFWK061411	PD Transformer / Circuit Breaker Rescue Training/ Sub Ops	ILT Class	Completed	Y			0.00
6/15/2011	PD-HS0008	PD Tower Rescue Training/ Sub Ops	ILT Course	Attended	Y		2.00	0.00
6/15/2011	PD-HS0008 MWSUBOPSAFWK061411	PD Tower Rescue Training/ Sub Ops	ILT Class	Completed	Y			0.00
6/15/2011	ENC005	Spill Prevention Control and Countermeasure Plans (SPCC) (ENC005)	eLearning	Completed	Y	Y		0.00
6/14/2011	HS0422	Bucket Escape	ILT Course	Attended	Y		0.00	0.00
6/14/2011	HS0422 MWSUBOPSSAFWK061411	Bucket Escape	ILT Class	Completed	Y			0.00
6/1/2011	DS10011	Annual Records Management Training	eLearning	Completed	Y			0.13
4/27/2011	HS0545	Bloodborne Pathogens	eLearning	Attended	Y	Y		0.00
4/27/2011	HS0152	EHS-Non-Nuclear Resp Fit Test	ILT Course	Attended	Y	Y	0.00	0.00
4/27/2011	HS0152 11094	EHS-Non-Nuclear Resp Fit Test HS0152 11094	ILT Class	Completed	Y	Y		0.00
4/27/2011	HS0277	CPR /AED/ First Aid Refresher	ILT Course	Attended	Y	Y	0.00	0.00
4/27/2011	HS0277 11116	EHS-CPR & First Aid Refresher HS0277 11116	ILT Class	Completed	Y	Y		0.00
4/27/2011	HS0148	EHS-Automatic External Defibrillat	ILT Course	Attended	Y	Y	0.00	0.00
4/27/2011	HS0148 11181	EHS-Automatic External Defibrillator HS0148 11181	ILT Class	Completed	Y	Y		0.00
2/11/2011	HS0461 MW	HS-Post-Trip& Pre-Trip Inspection	ILT Class	Registered				0.00
1/11/2011	EN0068	Migratory Bird Treaty Act (EN0068)	eLearning	Completed	Y		0.00	0.02
1/11/2011	HS0088	Lead in Construction	eLearning	Completed	Y			0.06
1/11/2011	HS0246	Class IV Asbestos Refresher	eLearning	Completed	Y			0.08
1/11/2011	EN0002	Hazard Communication	eLearning	Completed	Y			0.06
1/11/2011	PDEAP01	Power Delivery Emergency Action Plans and Fire Prevention Plans	eLearning	Completed	Y	Y		0.01
1/11/2011	HS0281	Electrical Safety Related Work Practices	eLearning	Completed	Y			0.02

Status Date	Training Activity Code	Training Activity Name	Training Activity Type	Registration Status	Completion Status	Pass (Y/N)	Estimated Credit Hours	Actual Hours
1/11/2011	HS0112	EHS-Basic Respiratory Protection	eLearning	Completed	Y			0.12
1/11/2011	HS0545	Bloodborne Pathogens	eLearning	Completed	Y			0.16
1/10/2011	PDHS0520 MWHRTWSUBM	OSHA 1910.269 Electrical Qualified Workers Signed Acknowledgment Form	ILT Class	Completed	Y			0.00
1/10/2011	PDHS0520 MWLRM	OSHA 1910.269 Electrical Qualified Workers Signed Acknowledgment Form	ILT Course	Attended	Y			0.00
12/30/2010	PDHS0520 MWBRESUBOPS010410	OSHA 1910.269 Electrical Qualified Workers Signed Acknowledgment Form	ILT Class	Registered				0.00
11/1/2010	TT6015	OSHA Crane Standard Training	eLearning	Completed	Y			0.12
10/20/2010	PD-TT0050	SIGNAL PERSON TRAINING FOR POWER DELIVERY	ILT Course	Attended	Y			0.00
10/20/2010	TT0050Hart102010	SIGNAL PERSON TRAINING FOR POWER DELIVERY	ILT Class	Completed	Y			0.00
10/20/2010	PD-TT0050	SIGNAL PERSON TRAINING FOR POWER DELIVERY	ILT Course	Attended	Y			0.00
10/20/2010	PD-TT0050 10202010	SIGNAL PERSON TRAINING FOR POWER DELIVERY	ILT Class	Completed	Y		3.00	0.00
7/8/2010	HS0470	HS-Bucket Rescue	ILT Course	Attended	Y	Y	0.00	0.00
7/8/2010	HS0470 0128	HS-Bucket Rescue	ILT Class	Completed	Y	Y	2.00	0.00
7/8/2010	PD-HS0007	PD Transformer / Circuit Breaker Rescue Training	ILT Course	Attended	Y	Y	1.00	0.00
7/8/2010	PD-HS0008	PD Tower Rescue Training/ Sub Ops	ILT Course	Attended	Y	Y	2.00	0.00
7/8/2010	HS0422	Bucket Escape	ILT Course	Attended	Y	Y	0.00	0.00
7/8/2010	PD-HS0006	PD Manlift Rescue Training/ Sub Ops	ILT Course	Attended	Y		1.00	0.00
7/8/2010	PD-HS0006 MWSUBOPS070810	Offering of PD Manlift Rescue Training/ Sub Ops	ILT Class	Completed	Y			0.00
7/7/2010	COBE2010	CoBE Refresher Training 2010	eLearning	Completed	Y	Y		0.00
7/7/2010	ENC005	Spill Prevention Control and Countermeasure Plans (SPCC) (ENC005)	eLearning	Completed	Y	Y		0.00
7/7/2010	HS0246	Class IV Asbestos Refresher	eLearning	Completed	Y	Y		0.00
7/7/2010	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y	Y		0.00
6/11/2010	ALERTC16L13	Alert Driving: Lane Changes (Commercial Truck Training)	eLearning	Completed	Y			0.08
6/11/2010	ALERTC23L11	Alert Driving: Failure to Give Way (Commercial Truck Training)	eLearning	Completed	Y			0.10
6/11/2010	ALERTC24L10	Alert Driving: Deadly Distractions (Commercial Truck Training)	eLearning	Completed	Y			0.15
6/11/2010	ALERTC22L9	Alert Driving: Speeding (Commercial Truck Training)	eLearning	Completed	Y			0.13
6/11/2010	ALERTC19L8	Alert Driving: Defensive Backing Techniques (Commercial Truck Training)	eLearning	Completed	Y			0.14
6/11/2010	ALERTC15L7	Alert Driving: Drowsy Driving (Commercial Truck Training)	eLearning	Completed	Y			0.12
6/11/2010	ALERTC21L6	Alert Driving: Slips	eLearning	Completed	Y			0.14
6/11/2010	ALERTC18L5	Alert Driving: Adverse Weather (Commercial Truck Training)	eLearning	Completed	Y			0.13
6/11/2010	ALERTC14L4	Alert Driving: Proper Use of Mirrors (Commercial Truck Training)	eLearning	Completed	Y			0.15
6/11/2010	ALERTC20L3	Alert Driving: Emergency Maneuvers (Commercial Truck Training)	eLearning	Completed	Y			0.16
6/11/2010	ALERTC17L2	Alert Driving: Hazard Avoidance (Commercial Truck Training)	eLearning	Completed	Y			0.14
6/11/2010	ALERTC13L1	Alert Driving: The Professional Defensive Driver (Commercial Truck Training)	eLearning	Completed	Y			0.04
1/7/2010	EN0002	Hazard Communication	eLearning	Completed	Y	Y		0.00
1/7/2010	EN0068	Migratory Bird Treaty Act (EN0068)	eLearning	Completed	Y	Y	0.00	0.00
1/7/2010	HS0081E	Emergency Plan & Fire Prevention	eLearning	Completed	Y	Y		0.00
1/7/2010	HS0088	Lead in Construction	eLearning	Completed	Y	Y		0.00
1/7/2010	HS0112	EHS-Basic Respiratory Protection	eLearning	Completed	Y	Y		0.00
1/7/2010	HS0217	EHS-Confined Space Entrant/Attend	eLearning	Completed	Y	Y		0.00
1/7/2010	HS0247	Asbestos, Man-made Vitreous Fibers and Lead	eLearning	Completed	Y	Y		0.00
1/7/2010	HS0281	Electrical Safety Related Work Practices	eLearning	Completed	Y	Y		0.00
1/7/2010	HS0446	Trenching and Excavations Safe Work Practices	eLearning	Completed	Y	Y		0.00
1/7/2010	HS0545	Bloodborne Pathogens	eLearning	Completed	Y	Y		0.00
10/23/2009	HS0422	Bucket Escape	ILT Course	Attended	Y	Y	0.00	0.00
10/23/2009	HS0470	HS-Bucket Rescue	ILT Course	Attended	Y	Y	0.00	0.00
10/23/2009	PD-HS0006	PD Manlift Rescue Training/ Sub Ops	ILT Course	Attended	Y	Y	1.00	0.00

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10/23/2009	PD-HS0007	PD Transformer / Circuit Breaker Rescue Training	ILT Course	Attended	Y	Y	1.00	0.00
10/23/2009	PD-HS0008	PD Tower Rescue Training/ Sub Ops	ILT Course	Attended	Y	Y	2.00	0.00
10/23/2009	ENC005	Spill Prevention Control and Countermeasure Plans (SPCC) (ENC005)	eLearning	Completed	Y	Y		0.00
10/23/2009	HSV001	Fossil Hydro Valve Implementation Program	eLearning	Completed	Y	Y		0.00
10/22/2009	PDGO02	eLearning: EAM_PDGO02 eMax Overview & Navigation	eLearning	Completed	Y	Y		0.00
10/22/2009	PDGO25	eLearning: EAM_PDGO25 Work Management Overview	eLearning	Completed	Y	Y		0.00
10/22/2009	PDGO30	eLearning: EAM_PDGO30 Power Delivery/Gas Operations Reporting Overview	eLearning	Completed	Y	Y		0.00
10/21/2009	FERC09C	Condensed FERC Affiliat Restrictions and Standards of Conduct	eLearning	Completed	Y	Y		0.00
10/21/2009	ISW709	Information Security Awareness	eLearning	Completed	Y	Y		0.00
9/23/2009	PD013	Purge Pitch and Delete	eLearning	Completed	Y	Y		0.00
9/16/2009	PDHS0520	OSHA 1910.269 Signed Acknowledgements	ILT Course	Attended	Y	Y	1.00	0.00
8/17/2009	HS0152	EHS-Non-Nuclear Resp Fit Test	ILT Course	Attended	Y	Y	0.00	0.00
8/3/2009	HS0277	CPR /AED/ First Aid Refresher	ILT Course	Attended	Y	Y	0.00	0.00
8/3/2009	HS0277	CPR /AED/ First Aid Refresher	ILT Course	Attended	Y	Y	0.00	0.00
8/3/2009	HS0217	EHS-Confined Space Entrant/Attend	eLearning	Attended	Y	Y		0.00
8/3/2009	HS0219	EHS-Conf Space Hazard Analyzer	ILT Course	Attended	Y	Y	0.00	0.00
8/3/2009	HS9828	Confined Space Entrant Initial	ILT Course	Attended	Y	Y		0.00
8/3/2009	HS0545	Bloodborne Pathogens	eLearning	Completed	Y	Y		0.00
7/22/2009	ENC005	Spill Prevention Control and Countermeasure Plans (SPCC) (ENC005)	eLearning	Completed	Y	Y		0.00
7/20/2009	HS0418	DO NOT USE THIS COURSE Portable Fire Extinguisher	eLearning	Completed	Y	Y		0.00
7/20/2009	HSD001	HS-Work Zone Safety/Flagging	ILT Course	Attended	Y	Y	0.00	0.00
7/8/2009	HS0272	EHS-Class III Asbestos Low Risk	ILT Course	Attended	Y	Y	0.00	0.00
7/8/2009	HS0461	Post-Trip & Pre-Trip Inspection	ILT Course	Attended	Y	Y	0.00	0.00
7/8/2009	EN0002	Hazard Communication	eLearning	Completed	Y	Y		0.00
7/8/2009	HS0088	Lead in Construction	eLearning	Completed	Y	Y		0.00
7/8/2009	HS0112	EHS-Basic Respiratory Protection	eLearning	Completed	Y	Y		0.00
7/7/2009	COBE2009	COBE Refresher Training 2009	eLearning	Completed	Y	Y		0.00
6/1/2009	EN0220	DOT Loading & Unloading Hazardous Materials	eLearning	Completed	Y	Y	0.00	0.00
6/1/2009	EN0228	DOT Materials of Trade (DE)	eLearning	Completed	Y	Y		0.00
6/1/2009	EN0229	DOT Shipping Compressed Gas Cylinders (EN0229)	eLearning	Completed	Y	Y	0.00	0.00
6/1/2009	EN0234	DOT Shipping and Transporting SF6 (EN0234)	eLearning	Completed	Y	Y	0.00	0.00
6/1/2009	EN0240	DOT General Awareness	eLearning	Completed	Y	Y		0.00
6/1/2009	EN0314	Hazardous Materials Security Awareness	eLearning	Completed	Y	Y		0.00
2/4/2009	HSC001	Osha Maintenance Std 1910.269	ILT Course	Attended	Y	Y	0.00	0.00
2/4/2009	PDHS0520	OSHA 1910.269 Signed Acknowledgements	ILT Course	Attended	Y	Y	1.00	0.00
2/4/2009	HS0281	Electrical Safety Related Work Practices	eLearning	Completed	Y	Y		0.00
11/6/2008	SAFEASBAWR	ASBESTOS/LEAD AWARENESS	ILT Course	Attended	Y	Y		0.00
11/6/2008	SAFEFIR101	FIRE EXTINGUISHER TRAINING (GET)	ILT Course	Attended	Y	Y		0.00
11/6/2008	HS0088	Lead in Construction	eLearning	Completed	Y	Y		0.00
11/3/2008	PDOR001	Power Delivery-Orientation for New Employees	ILT Course	Attended	Y	Y		0.00
10/31/2008	QUALELECFD	QUALIFICATION ELECTRICAL FUNDAMENTALS	ILT Course	Attended	Y	Y		0.00
10/31/2008	SAFEBASICS	BASIC SUBSTATION SAFETY	ILT Course	Attended	Y	Y		0.00
10/21/2008	SAFEHAZC01	HAZARDOUS MAT OPERATIONS LEVEL	ILT Course	Attended	Y	Y		0.00
10/20/2008	SAFECIRCLE	SAFETY TOPIC: CIRCLE OF SAFETY	ILT Course	Attended	Y	Y		0.00
10/20/2008	SAFEFRKLFT	FORK LIFT TRAINING	ILT Course	Attended	Y	Y		0.00
10/20/2008	SAFEFSTAID	FIRST AID TRAINING	ILT Course	Attended	Y	Y		0.00

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10/20/2008	SAFEBBPATH	BLOOD BORNE PATHOGENS	ILT Course	Attended	Y	Y		0.00
10/20/2008	SAFECPR101	CPR Recertification	ILT Course	Attended	Y	Y		0.00
10/20/2008	SAFE7STEPS	7 STEPS TO A HEALTHIER WORK PLACE	ILT Course	Attended	Y	Y		0.00
10/17/2008	HSC008	HS-Wood Pole Inspection	ILT Course	Attended	Y	Y	0.00	0.00
10/17/2008	SAFEJOBBRF	- REVIEW OF JOB BRIEFING PRESENTATION (RBU)	ILT Course	Attended	Y	Y		0.00
10/17/2008	SAFELCK101	FH - LOCKOUT/TAGOUT TRAINING - CLASSROOM	ILT Course	Attended	Y	Y		0.00
10/17/2008	SAFEWRKPRO	WORK AREA PROTECTION RULES/REGULATIONS	ILT Course	Attended	Y	Y		0.00
10/16/2008	SAFEEAPLAN	EMERGENCY ACTION PLAN	ILT Course	Attended	Y	Y		0.00
10/16/2008	ENVRAWARE	ENVIRONMENTAL AWARENESS	ILT Course	Attended	Y	Y		0.00
10/16/2008	ENVRSMISC1	SPCC/OIL SPILL/PCB TRAINING	ILT Course	Attended	Y	Y		0.00
10/16/2008	SAFESMHDRV	SMITH SYSTEM DRIVING PROGRAM	ILT Course	Attended	Y	Y		0.00
10/14/2008	SAFELADUSG	LADDER SAFETY	ILT Course	Attended	Y	Y		0.00
10/9/2008	SAFETRNSHR	FH - TRENCHING & SHORING CLASS	ILT Course	Attended	Y	Y		0.00
10/7/2008	SAFEBASICS	BASIC SUBSTATION SAFETY	ILT Course	Attended	Y	Y		0.00
10/6/2008	SAFEPEREQP	PERSONAL PROTECTIVE EQUIPMENT	ILT Course	Attended	Y	Y		0.00
10/1/2008	EN0002	Hazard Communication	eLearning	Completed	Y	Y		0.00
10/1/2008	HR231	E&C-Sexual Harassment	ILT Course	Completed	Y	Y		0.00
10/1/2008	HR261	New Hire Code of Business Ethics	eLearning	Completed	Y	Y		0.00
10/1/2008	HS1003	Office Safety	eLearning	Completed	Y	Y		0.00
10/1/2008	HS9015R	EHS-New Employee EHS Awareness -	eLearning	Completed	Y	Y	0.00	0.00
10/1/2008	ISW709	Information Security Awareness	eLearning	Completed	Y	Y		0.00
10/1/2008	PD011	Business Records	eLearning	Completed	Y	Y		0.00
10/1/2008	PD013	Purge Pitch and Delete	eLearning	Completed	Y	Y		0.00

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