
CONNEXUS ENERGY

Safety Manual

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Recent revisions:

- Mar - Corrected Lifesaving rules poster – correct order for “Isolate, Test, Ground” 2nd page
 - Apr - Added rules for barricading – Section 1 rule 102.01 - 02
 - Jun - Addition of Vehicle out of service criteria Section 1 rule 150.27 - 30
-



Dear Fellow Employees,

Dear fellow employees,

Our Safety Commitment - It's about you, your coworkers, your family, and our members

Connexus Energy's safety program is designed to preserve one of the most important assets we have. YOU. Your involvement, cooperation, and personal commitment to safety are essential. Safety is more than a list of rules to follow. At Connexus Energy, it is a core value and an important part of our culture. I believe that there is nothing more important than the health and safety of our employees, our families, and our members.

The objective of our safety program is to provide all of us with the necessary training, equipment, and awareness for a safe working environment. Since we work for our members, we must ensure we do everything we can to keep them safe at all times. And, safety doesn't stop on the job. I encourage you to apply those same set of guidelines at home with your families and friends and when you're out among the general public.

This safety manual provides all of us with a set of guidelines and rules which significantly enhance our level of safety. We must all understand those rules and guidelines which apply to our jobs. All employees are required to follow our safety rules. It's not only the right thing to do; it is our mutual commitment to each other.

Keeping us all safe is a team effort. Working together with this focus on safety, we have a goal of an injury-free Connexus Energy. We have a goal of everyone returning home each day, the same as you left in the morning.

On behalf of our Board of Directors and Leadership Team, I thank you for your continued commitment to safety.



Greg Ridderbusch

LIFESAVING RULES

Safety is a core value and an important part of our culture. We believe there is nothing more important than the safety of our employees, members, and business partners.

These 12 basic lifesaving rules are designed to eliminate serious injuries and fatalities. If you do nothing else, follow these rules to make it home to your family each day.

JOB BRIEFING



**ALWAYS DO A
JOB BRIEFING**

PPE



**ALWAYS INSPECT & WEAR
PROPER PPE**

STOP WORK



**STOP WORK IF A SERIOUS
HAZARD EXISTS**

DRIVING



**SAFE SPEED &
ATTENTIVE DRIVING**

DROPPED OBJECTS



**STAY CLEAR OF THE
DROP ZONE**

ENERGIZED WORK



ISOLATE, GROUND, & TEST

HEAVY EQUIPMENT



**STAY IN THE SAFE ZONE
ON WORKSITES**

SAFE EXCAVATION



**ALWAYS BENCH, SHORE, &
PROTECT IN EXCAVATIONS**

CALL BEFORE YOU DIG



IT'S THE LAW

WORKING AROUND ANIMALS



**BE CAUTIOUS
AROUND ANIMALS**

WORKING FROM HEIGHT



**PROTECT YOURSELF
FROM FALLS**

WORK ZONE



**USE CONES, BARRICADES,
LIGHTS, & HIGH VIS CLOTHING**

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Section 1

General Safety Guidelines

OBJECTIVE

Connexus Energy is vitally concerned with the safety of its employees, our customers, and the general public. We will make every effort to provide a safe work environment where we can.

The following Safety Rules have been established by Connexus Energy, and should not be interpreted as being all-inclusive for safely performing all work. All employees are responsible for their own safety, the safety of co-workers, and the safety of the public as it relates to the construction, operation, and maintenance of Connexus Energy's electrical system.

General / All employee job functions



101 Introduction

- .01 Safety of life shall outweigh all other considerations.
- .02 Employees shall report any injury, no matter how slight, as soon as is reasonably possible to their supervisor or manager.
- .03 Near Miss reporting and sharing is an expectation of all employees.
- .04 Any employee may stop the job if they feel the work has become imminently dangerous to a point where an injury or damage to property or equipment is likely.
- .05 Safety rules shall be strictly adhered to. Willful disregard of your own safety, that of your co-workers, and that of the general public shall not be tolerated and may be cause for discipline up to and including termination.
- .06 No work is ever to be considered so important or urgent that the necessary steps cannot be taken to do it safely.
- .07 Each employee shall assume responsibility for his or her own safety, and for those in their work area. This responsibility increases with experience.
- .08 Each employee shall be required to know and use the protection required for his or her job and shall be familiar with the tools and equipment required.
- .09 All employees are responsible for seeing that all applicable safe work practices are followed in the performance of the job. Each employee has the additional responsibility of assisting in the safeguarding of others.
- .10 An employee shall not use intoxicants or drugs while on duty, report for duty while under the influence of intoxicants or drugs, or be relieved by another employee known to be under the influence of intoxicants or drugs.
- .11 If an employee's physician has prescribed drugs or medication that will limit the employee's ability to perform certain jobs, the employee shall inform their supervisor – the supervisor shall confirm the employee can do the scheduled work safely, or remove them from that work.
- .12 The use of the word "shall" indicates a *mandatory* practice. The word "should" indicates an *advisory* practice.
- .13 Where advisory or discretionary judgments are used for work practices by supervisors and worksite leaders, safety shall be the primary consideration.
- .14 Interpretations and assistance with this Safety Manual are available from supervisors and from Loss Control staff.

- .15 Any confirmed deviation by an employee from these safety practices may be subject to Corrective Action. [see [The Advisor](#)]



102 Barricades, Barriers, and Warning Signs

- .01 Barricading consists of a means to surround the area with a physical barrier and a means to convey the hazard (i.e. conspicuous tape that says "danger - do not enter")
- .02 Barricading for energized work shall be used when:
- A digger derrick is being used for overhead line work and may come in contact with; energized lines or equipment, or lines or equipment that *could* become energized.
 - An aerial lift being used for overhead line work and *could* come in contact with energized lines or equipment whereby the uninsulated portion may become energized (i.e. line falls on vehicle).
 - Any excavation is to be left open and unattended
- .02 Employees shall heed warning signs. Where hazardous conditions exist, barricades, flags and flag persons, barriers and/or warning signs shall be used to warn employees and the public of the dangers.
- .03 Where hazardous conditions exist in a poorly illuminated area or after dark, adequate lighting shall be provided and flashing warning lights shall be placed on all sides of the hazardous area.



103 Batteries

- .01 For additional information, refer to manufacturers' product information and Material Safety Data Sheet (MSDS).
- .02 Adequate ventilation shall be provided in battery charging and maintenance areas. Where natural ventilation does not constantly change the air, forced ventilation shall be used. The manufacturers' recommendations shall be followed while charging batteries.
- .03 Approved signs shall be posted and observed in all battery charging and maintenance areas. Signs shall read Danger – No Smoking, Open Flames or Ignition Sources.
- .04 Approved eye wash facilities shall be available and located within 25 feet of the battery charging / maintenance areas.
- .05 Employees shall wear acid-proof gloves, aprons, goggles and face shield when handling acid or when the caps are open on lead acid batteries.
- .06 Care shall be exercised to prevent short-circuiting, generating a spark or ignition source when working on or near the battery or when cleaning or making repairs.
- .07 When making up electrolyte for batteries, employees shall always pour the acid slowly into the water, *not water into the acid*. The wrong procedure can cause an explosion.
- .08 A carboy tilter or siphon shall be used to handle electrolyte.
- .09 If electrolyte is spilled on clothing, the contaminated clothing shall be removed and the skin washed with water as soon as possible.
- .10 Open flames, tools that can cause sparks, and other sources of ignition shall be kept clear of the immediate area during charging operations.
- .11 Battery-powered vehicles shall be properly positioned and brakes set before charging operations commence.
- .12 When charging batteries, vent caps shall be kept in place. Care shall be exercised to ensure that vent caps are functioning properly. Battery compartment covers shall be opened to dissipate heat and vapors.

- .13 Care shall be exercised to prevent grounding the case of a NiCad cell, since the case is part of an electrical circuit.
- .14 When removing a battery, the ground connection shall be the *first* connection removed. When installing a battery, the ground connection should be the *last* connection made.
- .15 When using a hydrometer to check batteries, care shall be taken to prevent splashing battery acid.
- .16 If jumpers are used to start vehicles with dead batteries,
 - a. The 1st jumper shall be connected *first to the positive terminal of the dead battery, then to the positive terminal of the live battery.*
 - b. The 2nd jumper shall be connected *first to the negative terminal of the live battery and then to a suitable ground - not the negative terminal of the dead battery.*
- .17 Batteries shall be properly disposed of in an environmentally safe manner outside of shop area. Spent dry cell batteries shall be placed in an area of good general ventilation away from ignition sources and outside shops and employee workstations.

104 Bloodborne Pathogens

- .01 First aid providers and others who may reasonably anticipate having exposure to blood or other potentially infectious materials shall follow the procedures outlined in the Exposure Control Plan ([see Appendix 4](#)).
- .02 Avoid direct contact with blood and bodily fluids. Whenever possible utilize a waterproof barrier (latex or plastic) between you and the wound or bodily fluids.
- .03 All contaminated materials shall be properly disposed of.
- .04 Practice universal precautions as taught in First Aid.
- .05 In case of an exposure incident, notify your supervisor and/or Loss Control within 24 hours.



105 Chain Saws

- .01 The following personal protective equipment shall be worn when operating chain saws: hard hat, gloves, safety glasses, safety rated boots, and cut proof chaps. Chaps are optional while in an aerial bucket – chainsaws shall never be running while the blade is inside the bucket.
- .02 The starter cord shall not be wrapped around the hand when starting the engine. Watch clearances and make sure of footing before pulling the cord.
- .03 The operators shall be sure everyone is in the clear and the operator has good footing before using the saw.
- .04 During refueling, smoking or open flames shall not be permitted in the area. The engine shall be stopped. A hot engine shall be allowed to cool before refueling.
- .05 If user is in an aerial bucket, the saw shall not be started inside the bucket.
- .06 Saws shall be stored in carrying cases or the guard over the blade when not in use.
- .07 When operating chainsaws, a second person shall be within adequate response distance (within earshot or line of sight).

106 Clothing, Jewelry, and Accessories

- 01. Field employees should wear company supplied and approved clothing, which identifies them as a Connexus employee. Clothing should be in good condition and not be torn, tattered, or compromised as to offer inadequate protection for the job being done.

02. Loose dangling jewelry or flapping clothing such as neck ties and unbuttoned cuffs, shall not be worn when working around moving machinery or rotating parts.
03. **When work is performed within reaching distance of exposed energized parts or equipment**, the employee shall remove or render nonconductive all exposed conductive articles, *such as chains, rings, wrist watches or bands, or body piercings*, unless such articles do not increase the hazards associated with contact with the energized parts.
04. Special care shall be used to make sure that rings and other jewelry items do not catch on fixed objects when employees move from one elevation to another.
05. Employees shall be required to wear a hair net if hair length creates a hazard around moving machinery.
06. Employees engaged in climbing poles or structures, or in work areas where there is danger of injury to the arms such as cuts, abrasions, or thermal burns shall wear an **approved** long sleeve shirt buttoned or pulled down to the wrist.
07. During work on energized wire or equipment, clothing made from the following types of fabrics, either alone or in blends, is **prohibited** from wear; *acetate, nylon, polyester, rayon*.
08. Where there is potential exposure to electric shock or arc flash hazards, affected employees shall wear approved fire retardant (FR) apparel at the appropriate level of protection for the incident energy present.
09. Personal audio headsets and earphones shall not be used while operating a company vehicle, nor shall they be worn while performing any work outside of office tasks (and then only with supervisor approval).

107 Compressed Gas Cylinders

- .01 Cylinders shall be stored in designated areas and shall be secured in an upright position. Oxygen cylinders shall be stored at least 20 feet from fuel gas cylinders or other combustible material, such as oil and grease, or be separated by an approved fire wall.
- .02 Cylinders shall not be dropped, struck, rolled in the horizontal position or exposed to temperature extremes.
- .03 When opening the cylinder valve the cylinder valve discharge shall be turned away from the operator and opened slowly. This does not apply when the cylinder is required to be in an inverted position.
- .04 Caps provided for valve protection shall be in place on the cylinder hand-tight, except when regulators are attached. Utmost caution shall be used when removing caps to assure that the valve assembly is not unscrewed along with the cap.
- .05 Valves shall be kept fully open (if empty) or fully closed when not in use. If a special wrench is required, it shall be left in place on the valve stem for immediate use in case of emergency.
- .06 Oil and grease shall not be permitted to come in contact with torches, valves, regulators, gauges or fittings of oxygen cylinders.
- .07 Compressed gas shall not be released from any cylinder without using a suitable regulator except to initially clean the valve orifice. The control valve shall be opened only enough to blow out any foreign particles before connecting the regulator or line to the cylinder.
- .08 Acetylene and hydrogen cylinders shall not be vented.
- .09 Sparks or flames shall be kept away from cylinders or hoses. A sign Danger – No Smoking, Open Flames or Ignition Sources shall be posted in rooms or at entrances to areas where fuel gas is stored or used.
- .10 Oxygen shall be used for purposes intended and not for such purposes as to blow out pipelines, dust clothing, start engines, operate pneumatic tools, operate paint-spraying devices, or to pressurize tanks.
- .11 Cylinders in use shall be secured to a special cart or secured to a stationary object such as a hand rail or column.
- .12 Tanks shall not be taken into confined spaces for cutting, welding, etc.
- .13 Cylinders shall be properly secured in the upright position while being transported. Cylinders being transported shall have valve caps in place unless secured in a special cart or truck.

- .14 Transportation of all compressed gas cylinders shall comply with DOT regulations. Vehicles shall be properly marked (placarded) when transporting cylinders that exceed DOT limits.
- .15 Cylinders shall be legibly marked as to contents.
- .16 Acetylene shall not be used at a pressure in excess of 15 psi.
- .17 Regulators shall be removed and valve caps put in place while cylinders are being transported on elevators.

108 Desktop Computer Practices

- .01 .Position the top of the display screen slightly above eye level and to avoid glare on the screen.
- .02 Adjust work surfaces and space to comfortably perform work tasks within normal reach (do not have to extend elbows)
- .03 Adjust keyboard position to ensure proper position, angle, and comfort. You should keep wrists in a “neutral” position.
- .04 Take stretch breaks to alleviate or delay onset of fatigue as necessary. They are suggested every 20 minutes.
- .05 Sit upright to avoid straining neck and back.
- .06 Use a footrest if feet don’t rest comfortably on the floor.
- .07 Shift sitting position frequently to relax tension away and promote blood flow to legs.
- .08 Blink frequently. Make a conscious effort of it so your eyes won’t get dry.



109 Confined Spaces

- .01 Any suspected confined spaces shall be reported to Management or Loss Control. Confined spaces shall not be entered by Connexus Energy employees, unless specifically given permission and site specific training by a qualified person. Contact your supervisor if you suspect a confined space.
- .02 A confined space by definition is; any space has a limited means of egress, may be subject to the accumulation of a toxic or flammable contaminant (gas), or has an oxygen deficient atmosphere. Tanks, vaults, tunnels, pipelines, sewers, and open top enclosed spaces more than 4’ in depth are examples of confined spaces.



110 Cranes and Hoists

- .01 Cranes and hoists shall be operated only by trained and qualified personnel.
- .02 When materials are being lifted or transported overhead by a crane, employees in the area within the cranes reach shall wear approved head protection.
- .03 The controls of all cranes shall be distinctly marked so that their functions cannot be misunderstood.
- .04 The operator should take all signals from the designated signalman. Should it be apparent that obeying a signal would result in an injury, the operator shall not proceed but shall notify the signalman at once. A STOP signal shall be obeyed by the crane operator regardless of who gives the signal.
- .05 All lifting equipment, slings and attachments shall be properly marked to show load capacity.
- .06 The rated capacity of the equipment shall not be exceeded.
- .07 Clearances shall be checked before raising or lowering a load.

- .08 After the slack is taken up, employees shall stand clear of the load before the actual lift is started, unless a greater hazard exists by not assisting with slack uptake. When moving large, heavy equipment or materials by crane, a tag line shall be used.
- .09 Operators shall not move loads over the heads of employees. Employees shall not work under suspended loads or inside the angle of a winch line.
- .10 The operator shall not leave controls unattended when the load is suspended.
- .11 Upon leaving the crane or hoist, the operator shall be certain to open all necessary switches or controls or apply brakes to prevent movement of the crane or hoist while unattended.
- .12 Approach distances with overhead lines shall be constantly checked. An observer shall be used when cranes or hoists are within ten feet of exposed energized overhead lines.
- .13 When working within ten feet of exposed energized lines or equipment, cranes shall be properly grounded, or lines or equipment shall be insulated or isolated.
- .14 Employees shall exercise extreme caution when working in the vicinity of a mobile crane that is operating near exposed energized equipment.
- .15 If the mobile crane accidentally makes contact with energized equipment, employees shall not approach the crane until the contact is broken or the equipment is known to be de-energized. If it becomes necessary for the operator to leave the crane, the operator shall jump clear rather than step down.
- .16 Outriggers shall be used to level a mobile crane. Once the initial strain is taken, and before proceeding with the job, the blocking and outriggers shall be re-checked to assure stability.
- .17 Should an overhead crane or hoist lose power, the controls shall be turned to the OFF position, until power is restored.
- .18 An approved fire extinguisher shall be easily accessible to the crane operator.
- .19 After the load is removed, the hook and/or slings shall be secured.
- .20 Hoisting cable shall be visually inspected each day before it is used.
- .21 A load shall be attached to the hook by means of slings or other approved devices.
- .22 "Shock" loads shall be avoided.

111 Ergonomics

- .01 Arrange workstations and/or work areas to accommodate a full range of required movements.
- .02 Ensure that all machine controls are reachable and easily accessible prior to operation.
- .03 Ensure that lighting is adequate to perform task activities.
- .04 Ensure that adequate space is available to allow safe lifting of loads using both hands, while facing the load. Avoid repetitive lifting where possible.
- .05 Arrange work spaces and areas to avoid the need for carrying objects overhead and for overreaching.
- .06 Tools should be selected for ergonomic features.
- .07 Vibration dampening products or PPE should be used on vibratory type tools and equipment where applicable.



112 Eye Protection

- .01 Only approved eye protection (meeting ANSI Z-87.1) that is in serviceable condition shall be worn when eye hazards are present.

- .02 Eye protective equipment shall be worn on jobs or in areas where hard hats are required, in all designated eye protection areas, on all jobs where it has been specified that eye protection is required, and at any time a hazard to the eye exists.
- .03 Basic eye protection should consist of safety glasses with frontal and side protection. Additional or specialized eye protection shall be worn as required by the job.
- .04 Contact lenses shall not be worn when handling acids and caustics.



113 Fall Protection

- .01 Only approved personal fall-arrest equipment shall be used and shall meet appropriate / current standards.
- .02 Employees shall be instructed in the use of fall-arrest equipment and/or positioning devices prior to using them on the job.
- .03 All Fall Protection or Body positioning equipment shall be inspected before use to determine it is in safe working condition. Defective equipment shall be immediately removed from service & replaced if necessary.
- .04 Lifelines shall be protected against being cut or abraded.
- .05 Personal fall-arrest systems shall be rigged such that an employee may not free-fall more than six feet, nor contact any lower level.
- .06 **Carabiners** and snap hooks shall not be connected to each other.
- .07 Fall protection is required on all work above **four** feet unless working within an approved guardrail system.
- .08 Anchorage points for positioning devices and fall-arrest equipment should be located above the body belt or harness attachment point.
- .09 Fall-arrest equipment subjected to stress impacts caused by a fall or by testing shall be removed from service.
- .10 Point of attachment (anchor points) for fall protection equipment shall meet OSHA / ANSI standards (5000# shock load)

Note: Fall protection requirements for work on ladders, scaffolds or other non- standard work surfaces require special assessment – contact Loss Control

114 Fire Prevention

- .01 All No Smoking signs shall be strictly observed.
- .02 No open flames or spark-producing tools shall be used in an area where flammable or combustible liquids, dusts, vapors, or gases may be *present or stored*.
- .03 Each employee is responsible for reporting fire hazards, and eliminating the fire hazards when possible.
- .04 Each employee is responsible for knowing the emergency action plan for a fire.
- .05 Exit routes shall be kept clear of all obstructions.
- .06 Oily wastepaper, oily rags and other combustible materials shall be placed in approved containers with self-closing or self-extinguishing lids.
- .07 Fire extinguishers that have been discharged, (even partially), shall not be placed back in service, but shall be promptly tagged and removed from service. The discharged extinguisher shall be replaced with a fully charged unit – notify Loss Control for replacement.
- .08 Access to fire extinguisher or other fire protection alarms and equipment shall not be obstructed.
- .09 All extinguishers shall be kept at their designated location on a hanger or in a cabinet when not in use.

115 Flammable and Combustible Liquids and Gases

- .01 Flammable and combustible liquids and gases shall be kept and transported only in approved containers. Containers being transported shall be properly secured.
- .02 Safety cans containing flammable liquids shall be clearly identified as containing a flammable substance, and what that substance is.
- .03 Flammable hazard or combustible waste liquid shall be disposed of only into approved waste containers. Waste shall never be emptied into any drain.
- .04 Combustible waste material, such as oil or paint-soaked rags, shall be stored in covered metal containers and disposed of daily.
- .05 When pouring flammable liquid from one metal container to another, or in filling gasoline tanks, metal-to-metal contact shall be maintained between the two containers or between the hose nozzle and the tank to prevent static buildup.
- .06 Dispensing drums shall be equipped with self-closing spigots. Pipe connections on all drums and piped flammable liquids shall be vapor and liquid-tight.
- .07 Leaking hoses and nozzles shall be removed from service immediately.
- .08 Bulk containers used to dispense flammable liquids into another container shall be bonded to the receiving vessel and to ground to prevent static spark.
- .09 All spills of gasoline, oil or other flammable liquids shall be cleaned up immediately in accordance with spill procedures.
- .10 The cutoff switch for electric pumps used to dispense flammable liquids shall be clearly identified and easily accessible.
- .11 Place containers on the ground when filling with flammable liquid instead of in the back of a truck with a bed liner to prevent static buildup.

116 Foot Protection



01. For all employees who are exposed to foot hazards, such as fallen, dropped, rolled or pivoted heavy loads or objects, safety shoes or boots (meeting ASTM F 2413 - 05) with crush resistant toe are required as basic foot protection. Soles should be slip and puncture resistant, and of a nonconductive material.
02. Only serviceable footwear that is in good repair and appropriate for the job shall be worn.
03. Where special hazards exist, footwear that alleviates the special hazard may be required – see Loss Control for special needs.
04. Leggings are required when welding or cutting with low-quarter footwear. High-ankle boots may be worn in lieu of leggings as long as the tops of the boots are close-fitting and covered by the pants leg when welding.
05. During periods of ice and snow, traction footwear should be used. This footwear may be an additional overlay to standard footwear (such as Ice Trekkers) or an overshoe with embedded slip resistant material or stud/spike.

117 Forklift Operations



- .01 Only licensed and authorized personnel shall operate a forklift, and in accordance with manufacturers' safe operating instructions.
- .02 Hard hats and safety glasses shall be worn while operating a forklift when exposed to overhead hazards.

- .03 The operator shall complete an operator checklist at the beginning of each shift prior to using the unit. A written copy of the completed checklist shall be retained on file for at least one month's time.
- .04 When descending an incline, the load shall be to the rear of the direction of travel. When ascending an incline, the load shall be to the front.
- .05 Wheels shall be blocked if the forklift is parked on an incline.
- .06 Sudden stops that might spill the load should be avoided.
- .07 The horn shall be sounded when blind corners are approached.
- .08 Forklifts with gasoline or diesel engines shall not be operated in an enclosed non ventilated area for prolonged periods of time, so as not to exceed the permissible levels of carbon monoxide.
- .09 When a forklift is moved, loaded or empty, forks shall be carried as low as possible but high enough to clear uneven surfaces.
- .10 Loads should not be raised or lowered while the truck is traveling – the load may become destabilized.
- .11 The warning light on the forklift shall be turned ON whenever the unit is in operation (if the unit has one).
- .12 Passengers are not allowed to ride a forklift. No one shall be permitted to ride the load at any time.
- .13 No approved personnel cages are present at Connexus Energy. Forklifts shall not be used to lift personnel.
- .14 When forklifts are used in loading and unloading operations inside vans or trucks the vehicle shall be properly docked, and parked with the wheels safely chocked.
- .15 If control is difficult, unit malfunctions, or equipment fails, the unit shall be tagged out-of-service until repairs are made and the unit re-certified.
- .16 When the forklift is not in use, the forks shall be lowered, brakes set, and the key turned to the OFF position.
- .17 Personnel shall not stand or pass beneath the elevated forks, loaded or empty.
- .18 Forklift trucks should not be used in place of jacks or other lifting devices.
- .19 Only loads which are securely and safely loaded and within the rated capacity of the truck shall be handled.
- .20 When refueling forklifts, the engine shall be turned OFF.
- .21 Only approved attachments to the mast or forks shall be used. Improvised methods shall not be used.
- .22 All fork tine attachments, slings and lifting accessories shall be properly marked indicating load capacity.
- .23 The rated capacity of all equipment shall not be exceeded. Equipment not rated with load capacity shall be taken out-of-service until properly inspected and rated.
- .24 All attachments shall be designed / built by a certified engineer. No modifications may be made without certification.
- .25 Seat belts shall be worn while operating a forklift.

118 Dangerous / Hostile Premises



01. Any work to be done on a known or suspected **dangerous premise** (a premise you have reasonable suspicion is not safe to enter shall be discussed with a supervisor in advance to work beginning.
02. Any work done at a known **hostile premise** (customer) shall take place only after you alert law enforcement and an escort acquired.
03. System Operations shall be contacted for any afterhours work necessary at a known or suspected hostile premise when management or supervision is not readily available.

119 Golf Carts

- .01 Operators shall comply with all posted traffic signs and directions.
- .02 Drive the vehicle only as fast as terrain and safety considerations allow.
- .03 Avoid sudden stops or change of direction as they may result in a loss of control.
- .04 Use extra care when driving the vehicle across, up, or down an incline.
- .05 Feet, legs, hands, and arms should be kept inside the vehicle at all times.
- .06 Check the area behind the vehicle before backing up.
- .07 Do not exceed vehicle capacity, vehicle is limited to two occupants maximum.
- .08 Balance and secure loads before driving. Keep items within the perimeter of the cart. Stay within the weight limits of the cart.
- .09 Drive golf carts on Company property only. Driving carts on public roads is prohibited.



Golf Cart Battery Charging

- .10 Wear eye protection whenever working with the battery. Use extra care when working around the battery and charging equipment.
- .11 Charging must be performed in a well-ventilated area.
- .12 Inspect the charger AC and DC plugs for loose, bent, arced or dirty contacts. Inspect the vehicle receptacle for loose wires or damage. Tag out-of-service any damaged cords or parts.
- .13 Insert plug fully into receptacle and check that the connection is tight.
- .14 Be careful not to pull on the cord or place it in a position where it can be driven over or present a hazard to personnel working in the area.
- .15 When connecting or disconnecting the charger to a vehicle, always make sure that the charger has completed its charge and is OFF (ammeter indicates 0 amps). If the charger is not OFF, an electrical arc may occur when the charger is unplugged and may cause an explosion or fire.



120 Hand Protection

01. Employees should wear approved work gloves when handling sharp, rough, cold or heated materials or when the use of gloves will prevent hand injuries.
02. Only work gloves in suitable condition to protect the hands from the identified hazards, should be worn.
03. Special gloves approved for use in handling acids, caustics or other potentially injurious substances shall be worn when working with these materials. Consult the MSDS sheet of the substance before selecting gloves.
04. Approved leather gloves shall be used for cold protection in LPG Fueling operations.
05. Approved rubber insulated gloves shall be worn when working on or near exposed energized lines or equipment.
06. Rubber glove protectors shall not be worn in place of work gloves.



121 Hand Tools

- .01 All tools, regardless of ownership, shall be of an approved type and maintained in good condition. Tools are subject to inspection at any time. The supervisor has the authority to remove unsafe tools from service.
- .02 Defective tools shall be tagged to prevent their use and shall be either repaired or disposed of.
- .03 Potentially conductive tools shall not be used on or near energized conductors or equipment, unless wearing insulated gloves.
- .04 Tools should not be thrown from place to place or from person to person. Tools that must be raised or lowered from one elevation to another should be placed in tool buckets or firmly attached to hand lines.
- .05 Tools shall not be left unsecured on scaffolds, platforms, or other elevated places where their falling could endanger employees below.
- .06 Impact tools such as chisels, punches, drift pins and hammers, that become worn, mushroomed, or cracked, shall be dressed before further use, or replaced.
- .07 Chisels, drills, punches, ground rods and pipe shall be held with suitable holders or tongs, not with the hands, while being struck by another employee.
- .08 Wrenches with sprung or damaged jaws shall not be used. Adjustable wrenches should be pulled so force is applied to the side of the fixed jaw.
- .09 Only approved extensions shall be used for added leverage. The exception is when no other means exists and the extension is gradually loaded.
- .10 Only wrenches designed for the purpose shall be struck with hammers or impact drivers.
- .11 Tools with sharp edges shall be stored and handled so they will not cause injury. They shall not be carried in pockets. All cutting tools shall be kept properly guarded.
- .12 Tool handles that are loose, cracked or splintered shall be replaced. Handles shall be kept clean of oil and grease.
- .13 When working on or above open grating, the grating shall be covered to prevent tools or parts from dropping to a lower level, or the danger area below shall be barricaded or guarded.
- .14 The insulation on non-rated hand tools shall not be depended upon to protect users from electric shock.
- .15 Files and rasps shall be used with handles. They shall not be used as a pry, nor shall they be struck.



122 Hazardous Materials

01. User shall read and understand the product warning labels for the products and substances with which you are working. Additional information is available from the MSDS.
02. New materials, chemicals, and products that may have a hazardous component shall receive approval before use by evaluation via the New Substance Approval program – available through Loss Control.
03. Appropriate personal protective equipment (as defined in the warning label or MSDS) shall be worn to reduce exposure to injury or health risks.
04. Practice good personal hygiene to reduce exposure if working with hazardous substances.
05. Consult with a supervisor or safety staff member if you have any questions about working safely with hazardous substances.

Hazardous Material Spills

06. Any unidentified spill, or hazardous material spill, or leak should immediately be reported to a supervisor and Loss Control.
07. All effort shall be made to restrict access to the affected spill area.
08. Only employees with proper training and wearing appropriate PPE are allowed to clean up hazardous materials spills. Generally, spill cleanup will be handled by a contractor specifically licensed to do that work.
09. The person in charge, upon discovering spills that meet EPA criteria, shall report the spill to the MN Duty Officer.



123 Head Protection

- .01 Only approved hard hats or caps (meeting ANSI Z - 89.1) shall be worn on construction sites or any work involving the Connexus Energy distribution system.
- .02 Bump caps may be used in approved indoor applications, or by meter readers to protect against falling ice from rooftops in the winter / spring.
- .03 Head protection shall be worn by employees and non-employees under the following conditions:
 - a. In designated hard hat areas
 - b. In Substations
 - c. At ALL construction sites where overhead hazards exist
 - d. At any site where falling objects **may** be present
 - e. By those indoors in shops and warehouses, who are subject to falling objects or overhead hazards
 - f. At any other area where there is a danger of head injury, inclusive of tight spaces
- .04 Exceptions may be authorized by the supervisor if it is judged that a greater hazard exists, in areas not mentioned above.
- .05 Hard hats shall be kept clean and be inspected daily. Those found to be defective shall be replaced.



124 Hearing Protection

01. Employees shall wear proper hearing protection devices when exposed to noise levels above 85 decibels ([see Appendix 6](#) for listing).
02. Approved hearing protection shall be worn when employees are working in an area designated as requiring protection.
03. Hearing protection shall be worn on certain jobs as directed by the supervisor.
04. Employees who work in areas where hearing protection is required shall participate in the Hearing Conservation program.
05. Approved hearing protection is available and recommended for use in noisy work areas and can be obtained in the tool crib.
06. Employees required to wear hearing protection shall comply with the proper use, limitation & care of the protectors worn.
07. Employees shall inspect hearing protection devices daily. Defective devices shall be removed and replaced immediately.
08. Hearing protection that has the additional function as a personal radio or stereo is prohibited.
09. [See appendix 6](#) for noise level survey.

125 High Heat Environments

- .01 Employees who work in high heat environments shall follow the provisions of the Heat Index chart ([see appendix 1](#)).
- .02 Employees shall drink more water and take more breaks when working in high heat environments (over 95 deg F).
- .03 Employees working in the direct sun shall take precautions to prevent sunburn and heat stress. **This includes but is not limited to wearing shading, sunscreen, and cooling enabled clothing that covers exposed flesh.**

126 Housekeeping

01. Employees shall be responsible for maintaining a clean and orderly work place, whether on Company property, in vehicles, or at a job site.
02. Tools and material shall be placed so as not to create a hazard. Aisles, passageways and stairs shall be kept clear.
03. Scrap materials and debris should be picked up and disposed of promptly.
04. Protruding nails should be removed from boards, or the nails flattened.
05. Disposal of trash and debris shall be done in a safe and approved manner.

127 Indoor Air Quality

01. All employees shall comply with the smoke-free workplace policy.
02. Review warning labels on all products and materials to identify those that should be used cautiously when applied indoors.
03. Maintain adequate ventilation when work tasks such as cleaning, etc., may create potential airborne irritants.
04. Maintain good housekeeping and minimize dusts and particulates. Avoid exposures through restricted uses of aerosols, solvents or other vapor producing products.
05. Report unusual conditions or concerns to Building Services Department or your supervisor.

128 Job Planning

01. The employee in charge shall conduct a job briefing with the employees involved before they start each job.
02. The briefing shall cover at least the following subjects: hazards associated with the job, work procedures involved, special precautions, energy source controls, and personal protective equipment requirements.
03. The person in charge shall assemble the crew and explain the work to be done, outline the steps to be followed, personal protective equipment required, and point out the hazards of the job. The person in charge shall ensure that each member of the crew understands the instructions.
04. If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing shall be conducted before the start of the first job of each day or shift. Additional job briefings shall be held if significant changes, which might affect the safety of the employees, occur during the course of the work.
05. A brief discussion is satisfactory if the work involved is routine and if the employee, by virtue of training and experience, can reasonably be expected to recognize and avoid the hazards involved in the job. A more extensive discussion shall be conducted:
 - a. if the work is complicated or particularly hazardous
 - b. if the employee cannot be expected to recognize and avoid the hazards involved in the job.

06. An employee working alone need not conduct a formal job briefing. However, the employee shall ensure that the tasks to be performed are planned as if a briefing were required.
07. The person in charge is responsible for accounting for all employees upon the completion of each job.



129 Ladders

- .01 Only approved ladders shall be used in a safe manner. Manufacturers' weight limit shall not be exceeded.
- .02 Ladders shall be visually inspected before they are used.
- .03 Defective ladders shall be tagged and removed from service. If they are not repairable to serviceable condition, they shall be destroyed and disposed of.
- .04 Employees should face the ladder and use both hands when climbing up or down.
 - a. Tools should not be carried in the hands while climbing or descending a ladder.
 - b. Tools shall be raised or lowered in a safe manner when working on a ladder.
- .05 Employees shall not slide down a ladder. When climbing or descending, take one step or rung at a time.
- .06 Only one employee at a time shall work on a ladder. Exception is only for rescue efforts.
- .07 The ladder shall be moved as work progresses to avoid overreaching. Two ladders shall never be lashed together to make a longer one.
- .08 When using straight or extension ladders, employees shall not climb past the third rung from top.
- .09 Employees shall ensure that both latches of an extension ladder are seated properly. The minimum overlap for extension ladders is three (3) feet.
- .10 Ladders shall be tied off, top and bottom, to a substantial support whenever practical. Under certain conditions it may be necessary for another employee to hold the ladder to prevent falling or slipping.
- .11 The ladder shall be placed at a proper angle, with the base set out one foot for every four feet of ladder length.
- .12 When working from a ladder, and the job requires the use of both hands, fall protection should be used where feasible.
- .13 If an employee is required to transfer from a ladder to a landing, the side rails shall extend at least three feet above the landing.
- .14 When using a step ladder, the employee shall not stand on the top step or on the top of the ladder.
- .15 A step ladder shall never be used as a substitute for a straight ladder.
- .16 Before climbing a step ladder, employees shall make sure spreaders are fully extended and locked.
- .17 Employees shall climb the steps of a step ladder, not the support rungs.
- .18 Ladders shall not be painted, except that a non-skid coating may be applied to the top surface of steps or rungs.
- .19 Portable metal ladders and other portable conductive ladders shall not be used near exposed energized lines or equipment.

130 Lifting and Carrying

01. When lifting, carrying, or lowering objects, approved methods should be followed. Mechanical aids should be used whenever possible.
02. Approved methods include straight posture, lifting using leg muscles, good footing, and avoiding over-extending and twisting.
03. Loads shall be carried in such a way as to permit a clear view of the path and footing.

04. When carrying pipes, conduit or other long objects, special care shall be used when rounding corners and entering doorways.

131 Lighting

01. Where natural illumination is not adequate, artificial lighting shall be provided. Open flames shall not be used for purposes of illumination.
02. In areas where flammable or combustible vapors, gases, liquids, dust or fibers may be present, only equipment approved for the hazardous location shall be used.



132 Hot Line Tools

01. Each hot-line tool shall be visually inspected for defects before use each day. Live line tools should be wiped clean (a silicone wiping cloth is preferred) on a regular basis.
02. If any defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the hot-line tool is present after wiping, the tool shall be removed from service and examined and tested.
03. Hot-line tools used for employee protection shall be removed from service every year for examination, cleaning, repair, and testing as follows:
 - a. Each tool shall be thoroughly examined for defects.
 - b. Each tool shall be dielectrically tested to be within its rated value.
 - c. If a defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is found, the tool shall be repaired and refinished or shall be permanently removed from service. If no such defect or contamination is found, the tool shall be cleaned and waxed.
04. Hot-line tools shall not be painted nor any coating or modification applied, that may compromise its electrical rating.



133 Lockout/Tagout

Notes: Within C&M, System Operations, Electrical Repair, and Metering, employees shall be familiar with and comply with the clearance, switching, and tagging procedures for each facility. Refer to Switching & Tagging Procedures.

Within Fleet, Facilities, and Warehouse, employees shall be familiar with and comply with the Lockout/Tagout Procedures. Refer to this section, Lockout/Tagout.

- .01 Only approved and authorized personnel may apply locks or tags or other energy isolating devices to Company equipment, machinery or vehicles. All other affected personnel shall be trained in the purpose and application of the procedures.
- .02 Approved lockout/tagout, and application devices shall be the only devices used for controlling energy and tagging purposes, and shall not be used for other purposes.
- .03 Tagout devices shall be constructed and printed so that exposure to weather conditions or wet locations will not cause the tag to deteriorate or cause the tag message to become illegible. A tag shall not be substituted where a locking device could be used.
- .04 All information required on the tag shall be properly and legibly entered so that exposure to the elements will not cause the message to deteriorate. A pencil is the recommended writing instrument.

- .05 If more than one person is required to lockout or tagout equipment or machinery, each person shall place their own personal lockout or tagout device on the energy isolating device.
- .06 When an energy isolating device cannot accept multiple locks or tags, a multiple lockout/tagout device such as a multi-holed hasp shall be used.
- .07 As an alternative, to utilizing a multi-holed hasp to lockout a device, a single lock may be used to lockout the equipment or machinery with the single key to that lock being placed in a lockout box or cabinet which allows the use of multiple locks or tags to secure that cabinet. Each employee will then use their own lock or tag to secure the box or cabinet. As each person no longer needs to maintain their lockout protection, that person will remove their lock or tag from the multiple lockout device or the lockout box or cabinet, whichever is being used.
- .08 Shift changes shall be coordinated by the authorized employee in charge, to ensure the safe exchange of information and control of hazardous energies.
- .09 In the event work cannot be completed by the end of a shift, and there are no overlapping shifts or direct exchange of information between authorized employees assuming the work, the authorized employee in charge shall ensure the equipment or machinery is safe and properly secured, and that all required information is documented.
- .10 In the event an employee leaves the facility without removing his/her lock from equipment or machinery on which work must continue, all efforts shall be made to contact that employee to return to work and remove the lock or tag.
- .11 If an authorized employee who applied the lock or tag device is not available to remove it, and cannot be contacted, the lock or tag may only be removed according to the following procedure:
 - a. A supervisor and authorized employee, from the same department as the employee whose lock or tag has been applied, shall be assembled at the equipment or machinery.
 - b. The supervisor will verify that the authorized employee who applied the device is not available.
 - c. The supervisor and authorized employee will evaluate the equipment or machinery in question to include the inspection of any energy control device, all affected energy sources, (e.g., hydraulic, electrical, chemical, pneumatic, thermal, stored energy, etc.) and any other potential hazards that may result from continuing the maintenance and/or repair, or from restarting that piece of equipment or machinery.
 - d. Make all reasonable effort to notify the original authorized employee that their lock or tag has been removed.
 - e. Apply as necessary any new locks and/or tags to the equipment or machinery.
 - f. Document the results of this exception procedure and maintain with appropriate lockout/tagout files.

Lockout/Tagout Procedures

- .12 The authorized employee shall know the type and magnitude of energy sources that the machine or equipment utilizes and shall understand the hazards and the appropriate means to eliminate the hazard.
- .13 If the machine or equipment to be serviced is operating, it should be shut down using normal shut down procedures.
- .14 Operate the disconnect switch, line valve, or other isolation devices so that the equipment is isolated from its energy source(s). Always trace all lines of supply back to their source to assure that there are no added splices, connections or T's that have not been secured. Stored energy in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam or water pressure, etc., must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.
- .15 The authorized employee shall lockout and/or tagout the energy isolating devices with assigned individual locks and/or tags.
- .16 Any time a lock is used to secure an energy source, it must be accompanied by a tag identifying the person that installed it, the date and time it was installed, and a means by which the employee may be contacted.
- .17 At no time will the locking device be removed by anyone other than the person who is identified on the tag unless fully briefed by the person who placed the lock, or the forcible lock removal procedure was followed.
- .18 After ensuring that no personnel are exposed, and as a check on having disconnected the proper energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate.

- .19 All operating controls should be reset to NEUTRAL or the OFF position after the initial test, if the equipment, machinery, or vehicle being serviced or repaired has stored energy which cannot be realistically removed by dissipation, bleeding down, or restrained to prevent movement.
- .20 The equipment or machine is now locked or tagged out-of-service and maintenance or repairs may begin.

Termination of Lockout/Tagout

- .21 After the service and/or maintenance is complete and the equipment is ready to be tested and/or returned to normal operation, it must be inspected for completeness of assembly, the area around the machine or equipment must be checked to ensure that exposures to hazards or risks are minimal, and that all non-essential items have been removed from the operating area.
- .22 All equipment guards must be in place and properly adjusted.
- .23 All affected employees must be notified of the intention to energize and test the machine or equipment. All non-essential personnel will move to a safe location.
- .24 The authorized employee(s) who applied any lock or tag shall remove all lockout or tagout devices and operate the energy isolating devices to restore energy to the machine or equipment in the exact reverse order that they were installed.
- .25 Do not remove the last lock or tag until all hazards have been considered and corrected as needed.
- .26 All personnel shall be clear of moving parts before any re-energization.

134 LP Gas Operations

Note: See also [Section 115](#), Flammable and Combustible Liquids and Gases.

01. Only qualified employees shall fuel liquefied petroleum (LP) gas-powered vehicles.
02. Employees shall follow, in prescribed order, all procedures in fueling LP gas-powered vehicles and LP operations.
03. Employees fueling LP-powered vehicles shall wear approved personal protective equipment.
04. The main fuel line valve should be shut OFF in LP gas -powered vehicles left in buildings overnight.
05. Employees shall not vent LP gas fuel tanks inside buildings.
06. All suspected gas leaks shall be immediately reported to a supervisor.
07. Any confirmed gas leak shall require the valve be closed, the cylinder moved to an outside location, and the cylinder tagged out of service until repair is made.



135 Line Capacitors

01. Line capacitors shall be considered at full voltage until they have been removed from the line, and the terminals short-circuited and discharged to the ground by an approved method.
02. Employees shall not come in contact with an ungrounded capacitor case until the capacitor has been disconnected from the circuit and the terminals shorted.
03. Employees shall wear rubber gloves and use a live line tool to short and ground terminals.
04. Before employees work on capacitors, capacitors shall be disconnected & short-circuited, and a period of five (5) minutes must pass before the work begins on the capacitor.
05. Before handling, each unit in a series-parallel capacitor bank shall be short circuited between all terminals and the capacitor case or its rack. If the capacitors are on ungrounded substation racks, the racks shall be bonded to ground.

06. It is advised to use a rubber blanket or other shield when short circuiting or grounding suspected defective, or ruptured capacitors (potential hot oil spatter).
07. When unpacking new capacitors, if they are not shunted, employees shall shunt and ground them before handling.

136 Office Safety Practices

01. Open one drawer at a time to prevent the file cabinet from tipping over.
02. Do not lean back in chairs with feet propped or raised above seat level to prevent tipping over backward.
03. Damaged chairs or office furniture shall not be used. They shall be removed from service and tagged for repair or disposal.
04. Only approved step stools and ladders shall be used to reach elevated objects or locations.
05. Turn OFF and unplug office machines prior to making adjustments, repairs, or performing maintenance.
06. Keep overhead bins fully opened or closed.

137 Solvents, paints, aerosol cans

- .01 Review warning labels and follow recommendations for personal protective equipment, storage and handling practices.
- .02 When painting with a brush, on or near energized parts at 600 volts or above, the brush shall be attached to an approved insulated handle.
- .03 Adequate ventilation shall be maintained in enclosed areas when painting.
- .04 Only approved solvents shall be used to clean brushes. The solvent shall be disposed of properly in approved containers in accordance with environmental procedures.
- .05 Open flames shall not be permitted in the area where painting is being done.
- .06 Approved respirators shall be worn when spray painting is being done.
- .07 Air pressure to paint spray guns shall be properly regulated.
- .08 Oil-base paint, varnishes and paint thinners shall be kept and transported in approved containers.
- .09 When oil-base paint is kept in the original container, the lid shall be properly sealed so vapors do not escape. When not in use, containers of paint, lacquer, varnish, and thinners shall not be left open.
- .10 Oil-base paint, lacquers, and thinners shall be stored in an approved storage area, where there is adequate ventilation and no excessive heat.
- .11 Pressurized cans of paint, lacquer, etc. shall not be left in direct sunlight or where there is excessive heat. When not in use, pressurized cans with product shall be stored in an approved storage area.
- .12 Empty cans and cans with unusable product shall be placed in designated containers.

138 PCBs (Polychlorinated Biphenyls)

- .01 Breathing of PCB vapors shall be avoided. When working with PCBs in enclosed areas, adequate ventilation shall be used to prevent build-up of vapors.
- .02 Where PCB vapors cannot be completely dispersed, an organic vapor cartridge-type respirator shall be worn.
- .03 When employees are required to enter confined spaces, (such as a tank) where PCBs are present, self-contained or air-supplied breathing apparatus shall be used.

- .04 Employees shall avoid skin contact with PCBs. Approved gloves shall be worn for protection when the job requires placing hands in PCB liquid or handling parts or equipment contaminated by PCBs.
- .05 If skin contact occurs, the skin shall be washed with waterless hand soap and dried with paper towels, especially before eating, smoking, drinking or touching other parts of the body.
- .06 If there is a possibility of PCBs making contact with employees' clothing, approved protective clothes (apron or disposable coveralls and shoe covers) shall be worn.
- .07 Approved eye protection shall be worn any time employees work with or handle PCBs. Minimum eye protection shall consist of safety glasses. If a splashing hazard exists, goggles or face shield shall be worn.
- .08 If there is eye contact with PCBs, the eyes shall be flushed with water for 15 minutes and a physician consulted immediately.
- .09 Tools and other re-usable equipment used to work with PCBs shall be washed with approved solvent and wiped dry upon completion of the job.
- .10 Upon completion of any job involving PCBs, all contaminated disposable items (ordinary work gloves, rags, paper towels, coveralls, used solvents, etc.) shall be disposed of according to established environmental procedures.

Note: For additional information regarding handling, cleaning and proper disposal refer to the Connexus Energy SPCC plan.



139 Injuries

01. If an employee is injured on the job, the person in charge shall be notified as soon as is reasonably feasible. Injuries shall be reported to supervision and management as described in [Section 101](#).
02. Any employee who is injured on the job is authorized to seek medical treatment for that injury **immediately**.
03. On-the-job injuries and illnesses requiring medical attention shall be treated by a licensed medical provider.
04. An incident review shall be conducted to determine cause and what can be done to prevent future instances.
05. First aid kits should be present in all vehicles used for field operations. First aid kits shall be provided to employees who perform field operations, and those employees are responsible for maintaining and inspecting those kits on a regular basis.
06. First aid supplies shall be present in company owned facilities. Those supplies shall be maintained and inspected on a monthly basis by the operator of the vehicle.

140 Pneumatic and Hydraulic Tools

- .01 Pneumatic and hydraulic tools shall only be operated by trained personnel.
- .02 Pneumatic and hydraulic tools shall be used with care. They shall not be pointed at another person.
- .03 Pneumatic and hydraulic power tools shall be secured to the hose by a positive means to prevent the tool from becoming accidentally disconnected. Tools shall not be operated at pressures exceeding manufacturers' specifications.
- .04 Care shall be exercised to insure the trigger or control will not operate when the tool is laid down. The hose shall not be kinked in order to stop the tool.
- .05 Before making adjustments or changing pneumatic tools, unless equipped with quick-change connectors, the air shall be shut OFF at the air supply valve ahead of the hose. The hose shall be bled at the tool before breaking the connection.
- .06 Conductive hoses shall not be used near energized equipment.
- .07 The air tank drain valve should be opened at regular intervals to prevent excessive moisture accumulation.

- .08 Safety relief valves are required on air tanks and shall be tested periodically to insure proper operating condition. Relief valves shall not be tied down.
- .09 The supply line should be shut OFF at the source before disconnecting an air hose.
- .10 Reducers or pressure relief devices shall be used to ensure that compressed air used for cleaning purposes is below 30 psi.
- .11 Compressed air shall not be used to blow any contaminants from clothing that is being worn, or blown directly on the skin.
- .12 Manufacturers' stated safe operating pressures for hoses, pipes, valves, filters and other fittings shall not be exceeded.
- .13 The use of hoses for hoisting or lowering tools is strongly discouraged and should be done only when no other means is available.
- .14 Appropriate personal protective equipment shall be worn as required when using hydraulic or pneumatic tools.

141 Portable Electric Tools

- 01. The non-current-carrying metal parts of a portable electric tool, such as drills, saws and grinders shall be effectively grounded when connected to a power source unless:
 - a. the tool is an approved double-insulated type
 - b. the tool is connected to a ground fault interrupter,
 - c. connected by means of an isolating transformer, or protected by an "assured grounding system."
- 02. All power tools shall be inspected prior to use to ensure safe operation.
- 03. Power tools shall be used only within their design capability and shall be operated in accordance with the instructions of the manufacturer.
- 04. All tools shall be kept in good repair and shall be disconnected from the power source while repairs or adjustments are made.
- 05. Electric tools shall not be used where there is a hazard of flammable vapors, gases or dust.
- 06. All tools or cords should be disconnected by grasping the plug, not the cord. Extension cords shall be maintained in good repair. Cords for power tool use shall be of the three-wire ground type. Extension lamp cords shall have guards and should not be used for tool operations. Tools should not be lifted or lowered by the cord.
- 07. Ground fault interrupters shall be used when an electric tool is used in damp conditions or in an enclosed vessel.



142 Powder Activated Tools

- .01 Only those employees who are qualified (through training and experience) to use powder-activated tools are authorized to do so.
- .02 Explosive charges shall be carried and transported in approved containers.
- .03 Operators and assistants using these tools shall wear eye protection (safety goggles and/or face shield) and a hard hat.
- .04 Tools shall be maintained in good condition and inspected before each use.
- .05 This equipment shall be used only upon approved materials. Operators must know they can safely use the tool on the construction and composition of material the tool is being used on.
- .06 Prior to use, the operator shall ensure that any protective shields are properly attached to the tool.

- .07 The operator shall inspect the tool to be sure that it is clean, moving parts operate freely and the bore is free from obstructions. The bore shall be cleared before using. A charge shall not be fired to clear the bore.
- .08 A defective tool shall be tagged with a repair tag and immediately removed from service.
- .09 Powder activated tools shall not be used in an explosive or flammable atmosphere.
- .10 Tools shall not be loaded until just prior to the intended firing. Tools shall be unloaded immediately when work is suspended.
- .11 Only cartridges with an explosive charge adequate for the job and with proper penetration shall be used.
- .12 Tools and cartridges shall not be left unattended.
- .13 Tools shall be held perpendicular to the work surface.
- .14 Tools, loaded or unloaded, shall not be pointed at any person.
- .15 In case of a misfire, the operator shall hold the tool in place for 30 seconds. The operator shall then try to operate the tool a second time, and, if unsuccessful, shall wait another 30 seconds. Misfired cartridges shall then be removed, placed in metal container and returned to the supervisor.
- .16 Prior to firing a powder activated tool, advance warning shall be given.
- .17 Powder activated tools shall never be pointed at another person while loaded.

143 Property Damage

- 01. Any incident that results in personal injury or extensive property damage to non-employees (either on Company property or in connection with Company operations) shall be immediately reported to the Supervisor who in turn shall notify Loss Control.
- 02. All incidents (that result in a collision or damage) involving Company vehicles shall be reported immediately to your manager.
- 03. All incidents of property damage to the public shall be reported within the same shift of the occurrence.



144 Public Safety

- .01 Whether indoors or outdoors, precautions shall be taken to warn and restrict the public's exposure to hazards created by Company operations.
- .02 When working on or near streets and highways, signs, signals and other warning devices shall be used in accordance with local laws & ordinances – as well as to barricade any known or potential hazards.
- .03 When a Company operation affects pedestrian traffic in any way, every effort shall be made to warn and limit the public from the hazards which exist.
- .04 Unattended holes or floor openings shall be covered or adequately barricaded. Warning lights with proper barricades shall be placed at each opening or obstruction left overnight.
- .05 Employees finding low or fallen wires, broken poles or other damaged electrical equipment shall guard them until relieved by personnel qualified to deal with the situation, or until informed by an authorized person that the condition has been made safe.
- .06 Employees who recognize potentially hazardous operations such as; crane operations, well-drilling operations, erection of antennas, etc. adjacent to energized lines shall warn the individual and report the incident as soon as possible to System Operations.
- .07 Employees shall ensure that visitors are not unduly exposed to hazards and should ensure that they wear appropriate personal protective equipment or ask them to leave the worksite.

145 Respiratory Protection



Note: Use of respirators requires training specific to the type of protection. The device must provide adequate protection against the anticipated hazard. If in doubt, the higher protective device must be used.

01. Only approved respiratory protective equipment that is in good condition shall be worn by employees who are trained in the care, use, and limitations of respirators.
02. Welding fumes have been specifically identified as being potentially carcinogenic. Welding operations shall be done with either personal respiratory protection or point source ventilation. See [Welding Section 152](#) for further guidance.
03. Proper respiratory protective equipment shall be worn at any time a hazardous atmospheric condition exists. The manufacturer's instructions for respirator use shall be followed.
04. Employees shall be properly shaven prior to fit testing for, or use of, a respirator.
05. Employees covered by the Respiratory Protection Program shall be regularly fit-tested and shall participate in regular pulmonary evaluations to determine that they are physically able to wear a respirator while performing work.
06. Respiratory protection equipment shall be stored in a clean, enclosed container intended for that purpose.
07. For all respiratory protection, inspections shall be conducted prior to use, and documented at least annually. Defective equipment shall be removed from service and be immediately replaced.

146 Scaffolding



- .01 Scaffolds shall be designed by a competent person (person trained in their design and erection). Scaffold erection shall be done under supervision of a competent person.
- .02 Personnel using scaffolds shall be trained and certified as competent to use scaffolding.
- .03 Mobile single piece purpose built scaffolding may be used by qualified employees. No alterations shall be made to the mobile scaffolding without review by a competent person.

147 Solvents

- .01 Only approved solvents shall be used. Solvents shall receive approval by evaluation through the procedures of the New Substance Approval Program.
- .02 The SDS and warning label recommendations, precautions, appropriate protective equipment and safe work practices shall be strictly followed for each approved solvent.
- .03 Only approved hand cleaning products shall be used for hand cleaning – solvents generally are not approved for hand cleaning.

148 Stationary Powered Tools

- .01 Appropriate personal protective equipment shall be worn.
- .02 Machine guards shall be properly installed and shall not be removed except for inspection or repairs. Powered tools shall only be operated with the guards in place.
- .03 Stationary powered tools shall be secured to prevent movement.
- .04 A mechanical shifter shall be used to shift a belt in operation on multi speed machines.

- .05 “Belt dressing” shall be used and applied only after the machine is turned OFF and the belt idle.
- .06 Clamps should be used to hold work in a drill press.
- .07 Chuck wrenches shall be removed from the machine immediately after their use. Prior to machine operation a check shall be made to insure the wrench has been removed and machine is clear and ready for use.
- .08 Remote disconnect switches or circuit breakers shall be clearly identified and marked as to their purpose.
- .09 No gauging or calipering shall be attempted while the machine is in operation.
- .10 The tool rest shall have a maximum clearance of one-eighth of an inch from the wheel. The distance between the tongue guard and the wheel shall not exceed one-fourth of an inch.
- .11 The manufacturer’s recommended wheel speed shall not be exceeded.
- .12 Side-grinding shall be performed only with wheels designed for this purpose.
- .13 Grinding wheels should be run up to operating speed before work is applied. Wheels shall be dressed as necessary to prevent vibration.
- .14 Wheels shall be inspected for chips and cracks before mounting. Wheels shall not be forced onto the spindle.
- .15 The work shall not be forced against a cold wheel, but shall be applied gradually until the wheel is warm. The work shall be held firmly against the tool rest.



149 Substations & Remote Installations

- .01 Only authorized employees or contractors may enter a substation unescorted. All entry into a substation shall be communicated to System Operations before entry and upon leaving.
- .02 “Authorized employees” are employees or contractors who have received specific training on substation hazards.
- .03 Upon entering a substation where other workers are present, report your presence to the person in charge in order to exchange information on special system conditions affecting employee safety.
- .04 Employees and visitors not familiar with the hazards present in a substation shall be given special instruction before they are permitted to enter, and shall be accompanied at all times.
- .05 All those who enter substations shall wear an approved hard hat and eye protection. If any work that changes the state of any lines or equipment is to be performed within the substation, the appropriate level of FR and Arc Flash protection shall be worn, and appropriate approach distances maintained.
- .06 When working in an energized substation, gates shall be kept closed and latched except where employees have a clear line of sight to the open entry and exit point of the substation.
- .07 Substation keys shall be issued only to authorized persons. Employees are not permitted to loan substation keys to unauthorized individuals.
- .08 “Warning - High Voltage” signs shall be permanently displayed on the fence on all sides of the substation. “Danger - High Voltage” signs shall be displayed inside the substation.
- .09 Damage to fences shall be reported immediately to System Operations.
- .10 Parking shall not be allowed within the substation unless required for work purposes.
- .11 Those entering or working in an energized substation shall not carry anything at a height that can come in contact with substation components (other than approved hot line tools).
- .12 Before driving a vehicle into a substation, employees shall check clearances between protruding parts of the vehicle and the substation equipment and a ground guide used at all times.
- .13 No materials or equipment shall be stored under energized buses, lines or near energized equipment.

- .14 When leaving a substation, employees shall lock all doors, control houses and outside gates and check to be sure everything is secure and in proper order.
- .15 Vehicles shall not be driven over wire troughs. Except where specifically designed to bear vehicle weight (and are marked as such).
- .16 Barriers shall be used to warn of hazards caused by temporary work or substation conditions.
- .17 Fences around substations shall be bonded and grounded.



150 Vehicle Operation

- .01 Employees operating motor vehicles shall be properly licensed and company rules and principles of defensive driving shall be followed.
- .02 Vehicle operators shall understand and obey all federal, state, and local laws pertaining to vehicle operation.
- .03 Only authorized persons shall be permitted to operate Company vehicles or equipment. "Authorized persons" described as having been approved to drive by their manager, and have received the required training.
- .04 Unauthorized persons shall not be permitted to ride in Company vehicles unless permission is granted by the jobsite leader.
- .05 Where seat belts and shoulder harnesses are provided, they shall be used.
- .06 Employees should ride only in the passenger compartment provided in vehicle for their transportation, or seated within the body of the vehicle.
- .07 Internal combustion engines shall not be operated within closed garages or other buildings where adequate ventilation is not provided.
- .08 Employees should conduct a safety check before operating their vehicle. A vehicle that does not pass the safety check shall be reported promptly and removed from operation.
- .09 When **backing** - and a second person is available; a spotter shall be used. The spotter shall be positioned in such a manner as to see the area to the rear of the vehicle and be seen by the operator. The operator shall obey signals given by the spotter.
10. When loading vehicles, care shall be taken to balance or distribute the load as equally as practical.
11. When loading or unloading at a loading dock, vehicles shall be placed in PARK position, brakes set, and keys removed, or the wheels shall be chocked.
12. Vehicles should not be stopped closer than 10 feet to any railroad track. Work within 50 feet of the centerline requires railroad approval.
13. Unless otherwise posted, the speed limit on Company property is **10 miles per hour**.
14. Operators shall walk around their vehicle before moving it checking for hazards.
15. Smoking is prohibited in company owned vehicles.
16. Employees shall not board or get off of a moving vehicle.
17. Loads shall be secured in such a manner that under crash conditions they will likely remain on the truck or trailer.
18. On attached trailers, the safety latch on the pintle hook shall be closed and locked.
19. When carrying poles extending 4' (feet) past the end of the trailer, a correctly mounted and functioning light kit that marks each side, as well as the back, of the pole shall be used. Flags may only be used when light kits are unavailable.
20. The use of radar detectors in company vehicles, and personal vehicles used on company business, is prohibited.

21. No one shall be permitted to ride on/in a trailer unless the work is emergency in nature and the worksite is controlled.
22. “Micro Brakes” on vehicles shall not be used to hold vehicles on sloping grades.
23. It is recommended to back into parking spaces when feasible. Operators should plan their route to avoid backing when possible.
24. Using any electronic device while driving is prohibited (i.e. cell phone, Smartphone, etc.). Calls shall be made or taken by a second person, or pull off the road to a safe position to operate them.
25. Laptops shall normally be closed, secured, and out of airbag deployment range while driving in single occupant vehicles. EXCEPTION: Laptops may be operated (while driving) for the purposes of navigation.
26. When two occupants are present in a vehicle, radio operation or phone calls shall be made or taken by the passenger, not the person driving.

Connexus Fleet - Vehicle Out of Service Criteria

Connexus Fleet conducts periodic vehicle inspections to comply with State and Federal regulations. In addition, drivers of Connexus vehicles are expected to perform daily inspections of vehicles they are operating. Any defects or violations found during inspections or normal operation of vehicles and equipment need to be documented on the “Driver’s Daily Inspection Report” and turned into Fleet Maintenance department. Fleet will determine the proper repairs and if the repair will be done internal or subcontracted. Vehicles will be taken out of service if any of the following conditions apply:

27. Safety concerns – All vehicles will be taken out of service if there is any loss of vehicle function that would create a safety risk to the operator/driver. Such examples would be vehicle stalling, lights, steering, tires, suspension, brakes etc.
28. Further Damage to the vehicle – Vehicles will be taken out of service if the defect can cause additional damage to the vehicle if operated
29. Regulatory Compliance – Vehicles will be taken out of service if they do not comply with all State and Federal regulations.



151 Violence, Weapons, Personal Protection

- .01 Firearms, explosives or other dangerous weapons shall not be carried by anyone in the workplace or in Company vehicles.
- .02 Harassment or threats shall not be tolerated.
- .03 Threats or acts of violence on shall be immediately reported to a manager and/or the Security Department. Such acts off Company property shall be immediately reported to law enforcement.
- .04 Intimidation, horseplay, scuffling, practical jokes or similar activities are not permitted.
- .05 Whenever practical, employees shall announce their presence and state their business before entering customer premises. Employees should also notify the customer when leaving the property if practical.
- .06 Visible means of employee identification shall be used when entering customer property.



152 Welding, Cutting and Brazing

- .01 Only those qualified to do so shall be permitted to weld. Prior to welding or cutting, the area shall be inspected for potential fire hazards.
- .02 Oxygen and fuel gas hoses shall be inspected before use. Hoses which leak or show burned or worn areas shall be removed from service.

- .03 Adequate ventilation shall be provided during welding operations, or approved respiratory protective equipment shall be used.
- .04 Whenever practical, screens or fire-resistant curtains shall be placed around welding operations to protect workers nearby.
- .05 Any arc welding machine that gets internally wet shall be thoroughly dried and tested by a qualified person before being used.
- .06 Welding cables shall be inspected periodically for damage and loss of insulation. Cables in need of repair shall not be used.
- .07 Welding cable shall be uncoiled before use. The ground lead shall be firmly attached to the work. All ground connections shall be checked to be sure that they are mechanically strong and electrically adequate for the required current.
- .08 Only connectors specifically designed for the purpose shall be used to join ground and electrode cables.
- .09 An operator shall not weld with cables coiled around or placed on his or her body. Repair splices shall not be permitted within ten feet of the operator.
- .10 Electrode holders, when not in use, shall be so placed that they cannot make electrical contact with persons, conductive objects, fuel or compressed gas tanks. Electrodes shall be removed from holders when not in use.
- .11 Spent welding rods shall be properly disposed of in designated containers.
- .12 If the object to be welded or cut cannot readily be moved, all fire hazards in the vicinity shall be shielded, moved, or otherwise protected.
- .13 Suitable fire extinguishing equipment shall be available at the site in a serviceable state for instant use.
- .14 No welding or cutting shall be performed on used equipment, pipes, drums, barrels, tanks, or other containers until they have been cleaned so thoroughly as to make certain that there are no flammable materials present or substances that might produce flammable or toxic vapors.
- .15 Employees exposed to the hazards created by welding, cutting or brazing operations shall be protected by proper personal protective equipment or shielding.
- .16 Mechanical ventilation is required when welding or cutting is done on these materials; *fluorine compounds, zinc, lead, chlorinated hydrocarbons, beryllium, cadmium, mercury, alloys of these in combination, galvanized materials and stainless steel.* They are particularly hazardous and have specific control requirements. Refer to SDS for specific health hazards associated with these substances.
- .17 Under no conditions shall acetylene be generated, piped or utilized at a pressure in excess of 15 psig (or 30 psia).
- .18 Compressed gas cylinders shall be legibly marked, for the purpose of identifying the gas content, with either the chemical or trade name of the gas.
- .19 Cylinders shall be kept away from all sources of combustion and at least 20 feet from highly combustible materials, or protected by combustion resistant shields.
- .20 Valve protection caps shall always be in place, hand-tight, except when cylinders are in use or connected for use.
- .21 Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), 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.
- .22 Cylinders, valves, couplings, regulators, hoses and other equipment shall be kept free from petroleum based or other flammable substances.
- .23 Before attaching a regulator to a cylinder, stand to one side and open the valve slightly for only an *instant*, then close it. This "cracking" of the cylinder valve will clean the valve of dust or dirt.
- .24 Before a regulator is removed from a cylinder valve, the valve shall be closed and the gas released from the regulator.

- .25 An acetylene cylinder valve should not be opened more than one and one-half turns of the spindle. This allows ready closing of the valve in an emergency situation.
- .26 Always use the proper hoses. Fuel gas hose is usually red (sometimes black) and has a left-hand treaded nut for connecting to the torch. Oxygen hose is green and has a right-hand threaded nut for connecting to the torch.
- .27 Pressure-reducing regulators shall be used only for the gas and pressures for which they are intended.
- .28 Gauges on oxygen regulators shall be marked "Use No Oil".
- .29 Welding cable, hoses, and other equipment shall be placed so that they are clear of passageways, stairways and ladders unless properly guarded.
- .30 Matches, lighters, or hot work shall not be used to light a torch. A friction striker or other approved device shall be used.
- .31 After welding or cutting is completed, the hot metal shall be marked or other means shall be used to warn others.
- .32 When welding or cutting outside of specific designated areas, a "Hot Work Permit" shall be obtained.



153 Work Area Protection

- .01 ANSI Class 2 high visibility vests shall be worn on all construction sites, and any work within the road right of way. *During hours of darkness* ANSI Class 3 high visibility clothing shall be worn in the road right of way.
- .02 MNDOT Temporary Traffic Control Zone Layouts Field Manual shall be used to determine adequate highway work area protection. If inadequate protection is not available, an outside contractor shall be used to meet requirements for work area protection.
- .03 All signs shall be located on the side of the work zone and maintained at right angles to, and facing, oncoming traffic.
- .04 Only DOT approved warning devices shall be used on the road or road right of way.
- .05 If work is temporarily suspended signs should be covered or removed.
- .06 Any "flagging" shall be done by qualified employees who are dressed in ANSI Class 3 clothing. Radios are required for zones where flaggers cannot see each other or the work being performed.
- .07 The flashing lights / strobes on the truck shall be used in all situations where the truck is on the road or the road shoulder. Flashing lights should be used in the Right of Way.
- .08 Work area protection shall be installed along sidewalks where pedestrians may encroach upon the work area.
- .09 In hours of daylight law enforcement help should be requested for emergency work that impedes the flow of traffic or puts employees at risk. Law enforcement assistance shall be requested for emergency work during the hours of darkness for work that impedes the flow of traffic.



154 Weather

- .01 Sunscreen shall be worn when bare skin is exposed to direct sunlight.
- .02 During periods of high winds (30 mph or greater) – non emergency work on energized overhead lines and equipment should be restricted to that approved by Management.
- .03 During periods of extreme cold (below -10 F direct temperature, or -20 F wind chill) work shall be restricted to shorter periods and for essential work only. [See Appendix 2](#) for wind chill chart.
- .04 During periods of extreme heat (above 90 F direct temp or heat index) work shall be restricted to shorter periods with more frequent rest breaks. [See Appendix 1](#) for heat / humidity chart.

.05 Rubber Gloving is prohibited during periods of direct precipitation (dense fog, drizzle, rain, wet snow).



155 Working Around Animals

- .01 Only employees who have received training in animal behavior are allowed to work alone in / on premises that contain dogs.
- .02 Premises that have a known aggressive animal should have that information noted in the premise history.
- .03 All bites shall be reported – no matter whether there was a definable injury or not.
- .04 If work must be performed on a premise with an aggressive animal, that animal shall be confined in such a manner that they cannot reach the employee performing the work, BEFORE the work begins.

Section 2

Distribution Operations / Line Work



201 De-energizing Lines and Equipment

01. General

This section applies to the de-energizing of distribution lines and equipment for the purpose of protecting employees. These are the only procedures acceptable for de-energization. Lines and equipment ***shall be treated as energized until all elements of the procedures are met.***

- 02. For any lines or equipment to be worked as de-energized, they must be (in the following order). *If all 4 above conditions are not met the lines or equipment shall be treated as energized.*
 - a. Isolated via a confirmed visible open point(s) and,
 - b. Tested for voltage and found to be dead and,
 - c. Grounded in such a manner that all employees working on the lines or equipment are protected from differences in potential and,
 - d. **Tagged at each open point (SCADA tags are acceptable if a system operator is in charge of the clearance and the equipment is confirmed as open).**
- 03. One employee on the crew shall be designated to be in charge of the clearance and must comply with all of the requirements of this section in the order specified below.
- 04. **Request to de-energize**
The employee in charge of the clearance shall make a request of the system operator to de-energize the particular section of line or equipment. See [Section 219](#) for rules regarding when to get authorization and when to notify System Operations.
- 05. The employee in charge shall ensure that all; switches, disconnectors, jumpers, taps, and other means through which known sources of electric energy may be supplied to the particular lines and equipment to be de-energized are open and inoperable (i.e. lock applied).
 - a. ***Unless its design does not so permit***

- b. If the design does not permit, then ensure that they are tagged with a HOLD card to indicate that employees are at work.
06. Automatically and remotely controlled switches (SCADA) will have an electronic HOLD card (control inhibit) placed by System Operations ([see Section 219](#)).
07. HOLD cards shall be used to prohibit operation of the equipment and shall indicate that employees are at work ([see section 219](#)).
08. **Tested for voltage**
After the requirements in .03 through .07 of this section have been followed and the system operator gives a clearance to the designated employee in charge, all lines and equipment to be worked shall be tested for voltage.
09. **Protective grounds applied**
Before working on the lines or equipment protective grounds must be installed as required by [section 208](#).
10. **De-energized**
After the requirements in .03 through .09 have been completed, the lines and equipment involved may be considered and worked as de-energized.
 - a. If the line is tested dead but not grounded, all employees working on the line must wear appropriate PPE including properly rated rubber gloves.
11. **Transfer clearance**
To transfer the clearance, the employee in charge (or the employee's supervisor if the employee in charge must leave the worksite due to illness or other emergency) shall;
 - a. inform the system operator, and all employees working under that clearance, they are no longer the clearance owner and,
 - b. a new employee in charge shall be designated as the clearance owner and the clearance re-confirmed through System Operations
12. **Release clearance**
To release a clearance, the employee in charge shall:
 - a. Notify each employee working under that clearance of the pending release of the clearance;
 - b. Ensure that all employees working under that clearance are clear of the lines and equipment;
 - c. Ensure that all protective grounds protecting employees working under that clearance have been removed; and
 - d. Report a-c has been accomplished to the system operator to finish release of the clearance.
13. Only the employee in charge who requested the clearance, may release the clearance, unless the employer transfers responsibility as described in [section 219](#).
14. No one may remove tags without the release of the associated clearance as specified as described in [section 219](#).
15. No one shall initiate action to reenergize the lines or equipment at a point of disconnection until;
 - a. All protective grounds have been removed and,
 - b. All crews working on the lines or equipment release their clearances and,
 - c. All employees are clear of the lines and equipment and,
 - d. All protective tags/cards are removed from that point of disconnection.

202 Aerial Equipment / Digger Derrick Operations



- .01 Employees shall visually check the aerial device at the first job of the day where a boom / basket is used. The lower controls shall be operated and checked before anyone goes aloft.

- .02 No one on the ground shall operate the controls to the bucket truck or basket while someone is in the basket except in an emergency or when following the direct orders from the employee in the basket.
- .03 The truck shall be parked out of traffic whenever possible.
- .04 Employees shall make sure that the brakes are set before setting up the bucket truck. When parking on an incline, chocks shall be used.
- .05 When the vehicle is provided with outriggers, they shall be used. Before operating outriggers, employees shall first check to see that everyone is in the clear. The outriggers shall be firmly placed on pads or firm footing before operating the boom.
- .06 Employees in an aerial device shall wear an approved body harness with a self-retracting lanyard properly attached to the approved anchor point.
- .07 Employees shall not climb into or out of the basket while the basket is elevated, except in an emergency. Employees shall not belt off to a structure while working in the basket.
- .08 The operating control box shall be kept clear of materials and tools. No objects, except approved storage containers, shall be allowed to hang on the outside of the basket when working an energized area.
- .09 The boom should be cradled when the bucket truck moving. Employees shall not ride in a basket when the bucket truck is moving on the highway from job to job.
- .10 The manufacturer's load limit shall not be exceeded in the loading of a basket.
- .11 Employees shall position themselves below energized equipment when working on it, when practical. Work shall be only done on one conductor at a time.
- .12 Climbing hooks shall not be worn by employees who are working in a basket.
- .13 On a two-basket bucket truck, no change in basket position shall be made without the knowledge of both employees except in case of an emergency.
- .14 No tools or equipment shall be rigged to the basket in such a manner as to cause the basket to become unstable.
- .15 Good housekeeping should be exercised in the basket.
- .16 It is a best practice to ground the truck, to the system neutral, when working on energized lines. If this is not possible, the truck must be grounded in the best way possible, or barricaded and treated as energized during work.
- .17 Trucks that have an aerial device with an insulated lower insert are not required to ground to the system neutral if (and only if) the truck is outside the zone where an energized conductor may fall on the truck
- .18 Employees on the ground and in the bucket shall remain aware of work that *may* expose someone to a dropped object. Employees shall not work under an aerial device when a dropped object hazard exists.
- .19 Hard hats shall be worn by all personnel on any worksite where work is being conducted out of an aerial lift, at all times.
- .20 *Never* check for any hydraulic leak with your hand (even if wearing gloves) while the system is under pressure. Oil injection injuries are potentially fatal and are frequently misdiagnosed.



203 Capacitors

- .01 See [Section 135 Line Capacitors](#) for general rules – rules below are in addition for employees who routinely work on capacitors as linemen or qualified employees.
- .02 Before working on capacitors they shall be de-energized, shorted out, and grounded.
- .03 Employees shall wait five minutes before shorting out capacitors to allow the capacitor to drain itself by built-in discharging devices.
- .04 Live-line tools shall be used to short out and ground capacitors. Rubber gloves and a hot stick are minimum requirements.

- .05 When capacitors are removed from service, they shall be shorted out and remain shorted until they are placed back into service. They shall remain shorted when discarded.
- .06 When opening any disconnect which is associated with a capacitor; a load-break device shall be used.
- .07 When closing a capacitor bank that is controlled by a time clock or other remote device, check to be sure oil switches are OPEN, and set the time clock to close in the capacitors. If other electrical closing devices are available they shall be used.
- .08 All other line capacitor banks shall be closed with an insulated extendo stick from the ground or by using a minimum 8 foot hot line tool from a bucket.



204 Climbing Poles, Structures

- .01 Prior to climbing poles and structures, an inspection using the approved method shall be made to determine if the poles or structures are capable of sustaining the additional or unbalanced stresses which they will be subjected to from climbing or from adding or removing conductors or equipment.
- .02 When climbing poles, a second employee shall be present unless the repairs are absolutely necessary to safeguard the general public.
- .03 If the pole or structure cannot withstand the loads which will be imposed, it shall be braced or otherwise supported so as to prevent failure.
- .04 Prior to climbing a pole or structure, the employee shall become acquainted with the physical layout and condition of the conductors, poles, guys and equipment on the structure on which work is to be performed.
- .05 When climbing, employees shall avoid standing on any foreign equipment which may be attached to the pole or structure or located near it. Employees should not trust their weight to pins, braces, guy wires, lines or other such equipment which may be unstable.
- .06 When climbing poles care shall be exercised to set the gaff securely in the pole and to avoid weather cracks, knots, holes, nails, signs, grounds or other pole attachments.
- .07 Employees shall watch themselves hook their safety snap into the D ring when strapping off.
- .08 The safety belt shall not be placed around the top of the pole, the end of an arm, crossarm braces or in any place where it may possibly slip off. The safety belt shall not be placed around pins or similar parts of the structure which might break.
- .09 Climbers shall not be worn on the ground unless the employee plans to immediately climb another pole. If there are obstructions that may cause the employee to trip, or damage the gaffs, the climbers shall be removed before walking to the pole.
- .10 Employees shall check to be sure the gaffs are properly sharpened and within safe length limits.
- .11 When climbers are stored, the gaffs shall be covered with approved protectors.
- .12 When two or more employees are to work on the same pole, one shall reach the working position before the other leaves the ground. Descending the pole shall be done one employee at a time.
- .13 **ANDYS Rule:** When cable or wire is on the ground attached to a pole, and the pole is to be climbed, the wire or cable shall be placed out of the way of any and all vehicle traffic, or shall be detached, before the pole may be climbed.
- .14 Pole fall protection (PFP) shall be used in all pole climbing scenarios. When poles are wet or ice is present on the pole, attachments to the PFP should be used to increase the PFP's "bite" into the pole. Each climber shall have a PFP belt, and should use a secondary lanyard for climbing around obstructions. Best practice is to use a 4 D ring climbing belt so the secondary lanyard and PFP are not fastened into the same D ring on the climbing belt.
- .15 Employees working from a pole should use a pole saw when cutting trees. If a chainsaw is to be used employees shall:

- a. De-energize lines and equipment over 600V
- b. Never raise the saw over shoulder level while cutting
- c. Have both hands on the saw at all times while cutting



205 Current and Potential Transformers

- .01 Repair work shall not be performed on an energized instrument transformer.
- .02 Unless in normal operation, the secondary winding of a current transformer shall be short-circuited when the primary circuit of the current transformer has current flowing in it. Failure to do this results in dangerous voltage in the secondary circuit.
- .03 The cases of all instrument transformers shall be grounded except for the non-metallic cased 600-volt type.
- .04 The lack of voltage on the low voltage side of the potential transformer shall not be considered as positive indication that the high voltage side is de-energized.

206 Working alone

The following rules apply when working alone:

- .01 Routine switching may be done by one employee if they can perform the switching safely and outside of the applicable minimum approach distance (i.e. using an 8' or longer extended live line tool).
- .02 Working alone is permitted with live-line tools of 8' or longer, if the employee is positioned so that he or she is neither within reach of, or otherwise exposed to potential contact with parts energized at more than 600 volts.
- .03 Emergency repairs may be done by an employee working alone if the repairs are NECESSARY to ensure the immediate safety of others.
- .04 When operating chainsaws, a second person shall be within adequate response distance (within earshot or line of sight - see [Chainsaws section 105](#)).
- .05 When climbing poles, a second employee shall be present unless the repairs are NECESSARY to safeguard the general public.



207 Fall Protection

Note: Refer to [Section 113, Fall Protection](#) for general rules. **This section is primarily applicable to working from an aerial device.** See [Section 204 Climbing Poles and Structures](#) for fall protection rules relative to climbing.

- .01 Fall-arrest equipment, work positioning equipment, or travel restricting equipment shall be used by employees working at elevated locations more than **4 feet** above the ground unless an approved ladder, work platform, a guardrail system, or a safety net system is in place.

Note: Employees undergoing training are not considered “qualified” until they have received notice their supervisor has qualified them for this type of work.

- .02 Personal fall-arrest systems shall be rigged such that an employee can neither free-fall more than 4 feet nor contact any lower level. (Note – when climbing poles, only 2 feet of free fall is allowed)
- .03 Snap hooks may not be connected to loops the user makes in webbing-type lanyards or to each other.
- .04 A self-retracting lifeline shall be used in aerial devices due to the variability of the height those devices travel to and from, and the anchor point used shall be engineered to meet current ANSI and OSHA specifications.

208 Grounding Procedures

- .01 For employees to work lines or equipment as de-energized, the lines or equipment shall be de-energized, tested for voltage and grounded, unless the line or equipment has never been energized and there is no possibility of contact with another energized source, or the hazard of induced voltage is not present.
- .02 Approved protective grounding devices shall be used in accordance with approved grounding procedures.
- .03 Before installing a grounding device, an employee shall determine that the device is in serviceable condition.
- .04 Protective grounding cables shall be flexible stranded conductors of sufficient current carrying capacity to activate protective devices without damage to the cable, but no less than Number 2 stranded copper.
- .05 When work requires grounding, properly rated rubber gloves and FR clothing shall be worn during installation and removal of grounds.
- .06 Before grounds are attached, the circuit shall be de-energized, tagged and tested for voltage. Protective grounds shall not be removed until the work has been completed and all persons involved are in the clear.
- .07 As a best practice, a protective ground should be placed on all phase conductors at the point of work to create an equipotential zone. When grounding at the point of work creates congestion and is a hazard to the employee, grounds shall be placed on each side as near as possible to where the work is being performed.
- .08 When working on equipment where it is impractical to ground on each side of the work, equipment shall be grounded in at least one location. These situations do NOT meet criteria for working the lines or equipment as de-energized.
 - a. Exception: If the equipment as described above has never been connected to the electrical system (as in the case of new construction) and has no possibility of energization from any source, it may be worked as de-energized
- .09 When electrical testing requires that circuits or equipment be ungrounded, any protective grounds otherwise required shall be removed only during the test, using insulating equipment.
- .10 When grounding conductors, the grounding cables shall be connected to a suitable ground first; then the nearest phase conductor shall be grounded and the remaining conductors shall be grounded in order. Employees shall keep as far from the conductor as possible. When removing the grounding cable, the employee shall reverse the order being used and ensure that his body does not come in contact with conductors which are grounded.
- .11 Rubber gloves shall be worn when opening and closing grounds on both overhead and underground circuits.

209 Induced Voltage

Note: To guard against Induced Voltage refer to the following: [Section 208](#), Grounding Procedures; [Section 223](#), Wire Stringing Operations; and [Section 225](#), Working on or Near Exposed Energized Lines or Equipment.

- .01 On de-energized lines and equipment in the vicinity of energized high voltage stations, and where energized lines run parallel to de-energized lines, caution shall be exercised to guard against induced voltage.
- .02 Any crossing where Transmission voltages are present shall be tested to insure that the voltage from the transmission lines has not been induced to the distribution conductors.



210 Insulating Equipment

- .01 Insulating equipment shall be installed from a safe position, and whenever possible, from a position below the conductor or apparatus to be covered. The line or equipment nearest the employee shall be covered first. In removing insulating equipment, the equipment furthest away shall be removed first.
- .02 Insulating equipment (cover up, rubber hose or blankets, etc.) shall be inspected prior to use.
- .03 Climbing above exposed and energized (over 600 volts) conductors or equipment shall not be permitted.
- .04 When it is necessary to work on or near energized conductors or equipment, sufficient protective equipment shall be used to prevent accidental contact with the energized conductor or equipment.
- .05 All open leads and wires should be grounded or covered with insulating protective equipment whenever it is necessary to work around or climb through them.
- .06 When covering conductors carrying 7,200 volts and higher, employees shall be positioned in an insulated aerial basket, unless insulated (hot line) tools are used to install protective equipment.
- .07 When not in use, equipment shall be shielded from sunlight, heat, ozone, oil and other harmful agents and protected from physical damage from sharp or rough objects.
- .08 Blankets shall not be used on the ground without protecting them from physical damage and moisture by means of a tarp, canvas, or other protective mats.
- .09 Flexible equipment shall always be stored in a relaxed position. Blankets, line hose and hoods shall not be stored in folded or strained positions.
- .10 Barriers shall be used when working adjacent to energized conductors or equipment that cannot be adequately insulated with cover-up material. When barriers are erected near energized equipment or conductors, they shall be constructed of non-conductive materials.
- .11 All protective equipment shall be maintained in satisfactory condition. When it becomes defective, it shall be replaced or sent in for repair.
- .12 The person in charge shall ensure that the insulating equipment is properly inspected, and test dates are within specifications.
- .13 Testing or inspection of protective material shall be performed as follows:
 - a. Rubber insulating material – tested annually
 - b. Plastic brush contact material (plastic line hose) – inspected annually or per manufacturers guidelines
 - c. All materials shall be inspected prior to each use.



211 Insulating Rubber Gloves and Rubber Sleeves

- .01 Rubber gloves shall be worn when working on exposed energized lines or equipment energized at 50 volts or more.
- .02 Rubber gloves shall be inspected prior to each use.
- .03 “Rubber Gloving is prohibited during periods of direct precipitation (dense fog, drizzle, rain, wet snow). [See section 154 Weather.](#)”
- .04 Rubber gloves shall also be worn when working on ungrounded lines and equipment that are subject to backfeed and induced voltage.
- .05 In addition to rubber gloves, rubber sleeves shall also be worn, if exposed energized parts within reaching distance are not insulated from brush contact from the employee’s arms or body. This includes energized conductor or equipment not being directly worked on.

- .06 Rubber gloves shall be worn with approved leather protectors. Two pairs of rubber gloves, one inside the other, shall not be worn.
 - .07 Each day, before work is begun where rubber gloves are required, each glove shall be visually inspected and air tested by the employee using the gloves. Defective gloves shall not be used.
 - .08 Where rubber sleeves are required, each sleeve shall be visually inspected daily. Defective sleeves shall not be used.
 - .09 Rubber gloves and sleeves shall be electrically tested every 60 days, or more often if field conditions warrant.
 - .10 Rubber gloves and sleeves shall be stored in approved bags in a fully extended position. Rubber gloves and sleeves shall not be folded. Bags shall be either hung up or placed in a special compartment. They shall not be placed where other tools or equipment can damage the rubber gloves or sleeves.
 - .11 Rubber gloves shall be worn “lid to lid”, “cradle to cradle”, or “ground to ground” when lines or structures are energized, or have the potential to become energized.
- Note: For cabinet style equipment such as transformers, “Lid to Lid” means that once the lock is removed, rubber gloves must be put on before the lid is opened.
- .12 Care shall be taken not to allow gloves and sleeves to come in contact with oil-base products that can degrade rubber.
 - .13 No items are permitted to be placed in the rubber glove bag (or sleeves bag) along with the rubber gloves and protector gloves (or sleeves).
 - .14 Protectors shall not be worn as work gloves.
 - .15 Rubber gloves should be inspected after use – a thorough cleaning should be given if necessary.

212 Hot-Line Tool Work

- .01 Chains, metal slings or cables shall not be used in rigging between the pole and an energized circuit.
- .02 The hot stick method shall be used on energized circuits 69 kV or greater (such as a high side fuse, or disconnect) and above requiring uninterrupted service.
- .03 A HOLD card shall be installed on the circuit’s equipment, and OCR’s set to non-reclose or hot line tag, before performing hot-line work.
- .04 The Absolute Limit of Approach in [Appendix 8](#) shall be maintained from an energized conductor, the workman and tools, or the energized metal portion of a hot stick at all times.
- .05 Before the limits of approach are encroached upon, the hazard shall be moved or approved protective equipment used.
- .06 Rubber Gloves shall be worn when using hot-line tools (insulated sticks). The exception is for insulated extendo sticks that are extended at least 4 sections (or 16 feet).
- .07 If it becomes necessary to deviate from the original job briefing, all work shall stop and all changes shall be discussed with all crew members.
- .08 Hot-line tools shall be stored and transported in designated spaces that protect their integrity.
- .09 Hot-line tools should be wiped down with silicone impregnated cloth before and after they are used. This is required if the tool becomes dirty or wet. They shall be visually inspected for defects before use each day.
- .10 Work done on energized line with Hot-line tools shall only be done when the conditions are dry (live line tools are not wet).
- .11 A careful inspection of all Hot-line equipment shall be done prior to use.
- .12 A careful inspection shall be made of a structure before performing hot-line work.
- .13 Avoid unnecessary conversation during hot-line work.

- .14 Hot-line work shall be performed on one conductor at a time.
- .15 Working load / limits of hot-line tools shall be adhered to per manufacturer's specifications.
- .16 Extreme caution should be exercised when raising or moving conductors above the level of the conductors on the adjacent structures.
- .17 At least annually, hot-line tools should be closely inspected, cleaned, and refinished (if necessary) by qualified personnel and per manufacturers' recommendations.
- .18 "Hot sticks" **with the appropriate stick attachment** (i.e. grappler tool) shall be used to operate disconnect switches. When switching, employees shall keep as far as practical from the energized equipment.



213 Mechanical Lifting & Pulling Equipment

- 01. Only qualified employees shall operate mechanical lifting and pulling equipment such as cranes, derricks and winch lines near exposed energized lines. Safe distances shall be maintained according to [Appendix 8](#).
- .02 If the equipment could become energized, the energized lines shall be protected with line hose or similar brush contact material.
- .03 The mechanical lifting equipment shall be grounded and barricaded, unless grounding creates a greater hazard (as determined by management and the jobsite leader).
- .04 When mechanical lifting equipment is equipped with outriggers, they shall be used. Additional mats shall be used under outriggers for increased stability when working on unstable or sloped terrain.
- .05 Every effort should be made to prevent overloading of winches, cables and derricks. The manufacturer's designated load limit should not be exceeded. The load limit warning devices shall not be bypassed.
- .06 Cable or wire rope shall not be handled with bare hands.
- .07 When a winch line is operated, employees shall not stand inside the angle or arc made by the line when tension is applied.
- .08 Lifting or pulling straps, slings, chains, or wire rope shall not be shock loaded. Tensioning and loading shall be done in a gradual, steady, and controlled manner.
- .09 In assembling derricks, all pins shall be properly locked in place.
- .10 Employees shall not stand on, or pass under a suspended load. Nor shall they stand adjacent to, on top of, or under a loaded winch line.
- .11 All operators will comply with the boom & winch load limits as labeled on the equipment or described in the operators manual.



214 Pole Loading, Unloading & Hauling

- .01 During pole loading or unloading operations, employees shall not stand between the pole pile and the loading or transporting equipment.
- .02 Employees shall not stand or pass beneath suspended loads.
- .03 Care shall be taken to position employees and equipment in such a way as to avoid injury or damage, should a load of poles get out of control.
- .04 When loading or unloading poles and it becomes necessary to control the pole, employees shall work at the ends of the poles.
- .05 Employees handling poles shall always wear a hard hat, safety glasses and work gloves.

- .06 When poles are to be rolled from a pile or from a trailer to the ground, it shall be done with a line, cant hook or other approved tools.
- .07 Poles shall be securely fastened to the trailer when being hauled. During daylight hours, a red flag shall be fastened to the far end of the pole that protrudes furthest to rear. After dark or in inclement weather, a steady burning red light shall be affixed to the rearmost pole – end and both sides
- .08 When transporting poles, it is a best practice to use both a light kit, and a flag, attached to the rearmost end of the pole.
- .09 A pole trailer with a pintle hook attachment shall be properly connected to its towing vehicle with safety latches and chains.
- .10 Whenever possible, poles temporarily stored along the streets or highways shall be placed back of the curb or beyond the ditch line and blocked so that they cannot roll. If placed in tall grass in the ditch, they will be marked with flags or other high visibility markers above the grass height to alert any ditch traveling vehicles.

215 Regulators

- .01 Before the regulators are bypassed, the regulator shall be in the NEUTRAL position and the control power switch shall be OFF.



216 Rescue Operations

General

- .01 Rescue and resuscitation techniques shall be reviewed and practiced at least once a year by employee subject to OSHA regulation 1910.269.
- .02 Radio calls for emergency medical assistance in *life threatening* situations shall be identified with the words "Mayday, Mayday." Calls for other emergency situations shall be identified with the words "This is an emergency." *Mayday procedure is found in [Appendix 5](#).*
- .03 All other radio communication shall cease when a Mayday is called.
- .04 System Operations shall be notified of emergency situations as soon as is feasible. Employees may also choose to call 911 to request emergency assistance.

Pole/Structure Rescue

- .05 A rescue lifeline of one half inch minimum diameter shall be present whenever an employee climbs poles, towers or structures.
- .06 The rescuer shall exercise extreme caution to prevent from also becoming a victim. The circuit should be de-energized before attempting rescue.
- .07 Any rescue attempt on an "energized pole" may only be attempted if:
 - a. the rescuer has determined the rescue may be done safely and,
 - b. is wearing the properly rated clothing and PPE for the hazards present
 - c. System Operations - or - 911 has been made aware of the location and situation of the rescue attempt.
- .08 The rescuer should proceed to lower the victim to the ground as soon as possible via a safe and secure method.

Aerial Basket Rescue

- .09 The rescuer should lower the victim to the ground or lowest bucket travel position as soon as possible.
- .10 The victim should be removed from the basket as soon as is safely possible so that CPR can be administered.

Water Rescue

- .11 Whenever employees are engaged in work where the danger of drowning exists, they shall be required to wear a Coast Guard approved personal flotation device.



217 Service & Meter Install / Removal

- .01 When entering or working on customer property, employees shall check for hazardous conditions, such as tripping hazards, dogs, or other potentially dangerous animals.
- .02 Prior to starting work on a meter installation, all meter parts shall be treated as energized until tested for voltage. If a neutral or ground is disconnected, all meter parts will be treated as energized until a permanent ground is installed.
- .03 All exposed conductors within reaching distance shall be covered when pulling services. Services shall be de-energized where damage or deterioration may cause a flash if a meter is removed.
- .04 When working on or near energized any meter installation, the worker shall use the appropriately rated FR Clothing and PPE. ([See Appendix 3](#))
- .05 Only approved equipment shall be used in testing for voltage or in testing for polarity. Only approved hand tools shall be used.
- .06 All tools, leads, jumpers, and test equipment shall be frequently inspected. No defective tools or equipment shall be used. A check shall be made on temporary service supports to determine stability before putting a ladder against it.
- .07 When testing, one hand shall be used when possible to make connections to energized points. Meters shall not be installed or removed where explosive gases are suspected.
- .08 Before installing a meter in a new or previously vacated meter socket, a visual check shall be made of the meter (including nameplate and meter base) and enclosure to ensure that the proper meter is being used and the equipment is in good working condition.
- .09 On all reconnects and new services, tests shall be made for back feed, proper phasing and voltage, and grounded conductors before installing a meter.
- .10 All socket-type meters shall be installed or removed with approved gloves. Rubber insulating gloves and protectors are required when voltage protection is needed.
- .11 When inserting socket-type meters into socket bases or adapters, load-side prongs shall be inserted first, then line-side. Meter removal shall be accomplished in the reverse order.
- .12 When inserting socket-type meter, the cover shall not be struck with the hand, or a hard object (i.e. hammer). Should breakage occur or exist, all broken glass shall be removed from the meter and the customer's premises and disposed of in a safe manner. Broken or cracked glass shall be removed before shipping.
- .13 Before bypassing any meter device with jumpers, a check shall be made to ensure that all electrical connections are tight and, by use of a voltage tester, that the polarity of all jumpers is correct.
- .14 The secondary side of a current transformer shall not be opened while the primary side is energized.
- .15 Extreme caution shall be used when working on or near a 277 or a 480 volt meter – clearance times and available fault current may be higher with these configurations.
- .16 Meters shall not be installed or removed where explosive gases are suspected.
- .17 If a visual inspection of the metering installation reveals that the removal of the meter may cause a fault, no attempt shall be made to remove the meter until the service has been de-energized.
- .18 Customer loads shall be turned off before installing or removing meters, where practical.

- .19 Meter socket bypass handles should not be used as service load break devices, unless there is no other reasonable means to de-energize the meter.
- .20 When removing or installing a bolted-in, polyphase, self-contained meter, the meter socket should be de-energized, unless approved insulated (rated) tools are being used.
- .21 If a meter socket is to be left energized, a proper meter or approved socket cover shall be installed, **or other equally protective** measures taken.
- .22 A visual check shall be made of the meter base and the main switch before energizing the service. A test shall be made for grounded conductors.
- .23 Services shall not be energized without the consensus of all qualified employees present that it is safe to do so.



218 Setting and Pulling Poles

01. Poles being raised or lowered shall be handled with the butt end heavy, if possible. When a standing pole is cut off, it shall be kept under control at all times.
02. Truck outriggers shall be properly extended when setting or pulling poles. Outrigger pads shall be placed on firm footing.
03. While a pole is suspended from the derrick or truck's winch line, the truck shall not be moved unless an emergency condition exists.
04. When setting or pulling poles between or near energized lines, the employee who may contact or come in close proximity to the pole or truck shall:
 - a. Wear rubber gloves
 - b. Keep the boom and cable clear of conductors
 - c. Cover the conductors or pole with approved insulating material or equipment
 - d. Ground the truck to the system neutral
05. When setting or pulling poles in close proximity to an energized transmission circuit, the automatic reclosing apparatus protecting such circuit shall be rendered inoperative and a HOLD card shall be installed.
06. When picking poles, extreme caution shall be used to keep the pole under control at all times.
07. Employees shall not be on poles that are being plumbed or tamped unless they are properly secured.
08. When pulling poles or pole butts the cable or boom should not be overloaded due to the weight of the pole and its adhesion to the ground. Other suitable means such as pole jacks, digging around the pole, etc., should be considered.
09. When setting or pulling concrete or steel poles between or near energized lines, special attention shall be exercised to keep the pole under control. The conductors shall be covered with insulating equipment or the pole itself shall be covered with pole guards. A HOLD card shall be placed on the circuit, with the circuit on Hot Line Tag (preferred), or OCR's on non reclose.
10. Truck grounds shall be connected to the system neutral while setting or pulling poles near energized lines (of 7200 volts or greater).

Supporting of Poles During Excavation

11. A qualified operator shall be at the controls and the vehicle shall be running whenever the excavation process is in the near vicinity of the pole being held. The operator shall remain at the controls until the excavation process has cleared the pole and the proper support has been installed.
12. A vehicle may be left unattended only if the excavation has not caused the pole to be undermined or unsupported.

13. Coordination shall be established with the customer to ensure that advanced notice will be given to Connexus ensuring that a qualified operator will be available should the excavation undermine or destabilize the pole.



219 Switching and Tagging

Hot Line Tag (HLT)

- .01 Hot Line Tag is a personal safety feature of the circuit recloser's intended to reduce the arc-flash hazard when qualified personnel are working in close proximity to energized conductors or equipment.
- .02 Assertion of Hot Line Tag will modify the circuit recloser protective settings as follows:
- One shot to lockout.
 - Instantaneous trip (+ 0.05s mechanism response) for currents greater than the respective 560 A (phase) / 170A (ground/imbalance) or 400 A (phase) / 140A (ground/imbalance) pickups.
- .03 Closing is prevented while Hot Line Tag is active.
- .04 Hot Line Tag shall be applied when qualified personnel are subject to the following work conditions:
- Work is being performed within 5 feet of energized conductor or equipment.
 - Work is being performed within tool-drop or falling-distance of energized conductor or equipment.
 - To reduce the arc-flash hazard of equipment that has an arc-flash hazard category greater than 2 at distances greater than 8 feet.
 - 'As requested' by qualified personnel

Non-Reclose (NR)

- .05 For work outside of the arc-flash boundary, the recloser's Non-Reclose (NR) function shall be applied for the protection of distribution system equipment.
- Assertion of Non-Reclose will modify the circuit recloser protective settings to one shot to lockout.
 - Trip/response times will be dictated by the recloser's Time-Current Curve (TCC) – See [TCC chart in Appendix Z](#)

Tagging

- .06 There are two types of tags/cards that shall be utilized which apply only to distribution and transmission equipment in the field. HOLD CARDS (red card) and SECURE / INFORMATION CARDS (blue card).

Ref. OSHA 29CFR1910.269 (m) and NESC 442-444 Part 4.

HOLD ("RED") CARD

- .07 There is no more important safety device than a properly filled out and attached Hold ("Red") card, and the Connexus Energy Hold (Red) Card shall be used solely for the protection of human life. The policy for the use of Hold (Red) Cards will be as follows:
- .08 Hold cards shall be attached at all points of energization prior to physically working on de-energized lines and equipment, and at equipment rendered inoperable for safety purposes during hot line work (recloser / OCR set to non reclose or hot line tag). *Locks shall be applied and equipment rendered inoperable if there are provisions to do so and it can be accomplished safely.*
- .09 Hold cards shall be affixed by a means that will keep them in place despite environmental conditions, and in a place that clearly identifies the equipment or line being tagged.
- .10 Connexus System Operations shall place Hold cards, electronically and or manually, in supervisory control equipment situations (SCADA).
- .11 There are three ways Hold cards or clearances for work may be initiated or installed. They are:
- By request of a Power Dispatcher (Great River Energy, Xcel Energy, etc.)
 - By Connexus Energy System Operations
 - By field crews for self-protection

Responsibility:

- .12 It shall be the responsibility of the employee in charge at the work site(s) to install and remove required Hold cards. Only that person or entity that requested the clearance or Hold card can remove or give clearance to remove said Hold card. **Hold (Red) card numbers are NOT recorded in System Operations.**
- a. **(Exception) Construction and Maintenance (C&M) supervisory personnel, can give clearance to remove the Hold card – if that person who placed the hold card is confirmed unavailable and confirmation made that the clearance will not endanger any employees who may be working on or about that equipment or line.**
- .13 Hold cards shall be removed when the crew completes the work scheduled at each site they are used.
- .14 Hold cards shall be filled out completely with the minimum following information:
- a. The name of the installer
 - b. The name of requester
 - c. Date and time placed
 - d. Equipment identity and location
 - e. Clearance number - if requested
 - f. Reason for Hold card.
- .15 If two or more crews are working independently on the same section of line, *each crew* shall install their own hold cards following the rules stated above - in steps (a) through (g).
- .16 Removed hold cards shall be returned to C&M Group Leaders for record keeping and monitoring

SECURE / INFORMATION CARD (BLUE CARD)
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- .17 A Secure / Information (“Blue”) Card is used to prevent service interruption, damage to equipment, or for system information. **It is never to be used to protect human life.**
- .18 Blue cards may be attached by any employee where they feel the information may be beneficial for the operation of the electrical system. Any qualified C&M (Construction and Maintenance) employee may remove Information cards after the condition has been corrected.
- .19 Situations that require information (Blue) cards are:
- a. Underground cable faults that are left to be repaired at a later date. Attach an information card at cable ends and closed open points.
 - b. Attach to devices or equipment that will be left in a temporary condition or abnormal condition
 - c. Devices or equipment not in use that is left to repair or use at a later date.
- .20 **Information (Blue) cards are not recorded in System Operations – temporary conditions are**
- .21 Information (Blue) cards shall be filled out completely with the minimum following information:
- a. The name of the installer
 - b. Date placed
 - c. Equipment or location ID number
 - d. Reason for installing the card
 - e. The number for the trouble order, job order, or a system operations order
- .22 Removed Secure cards shall be returned to C&M Group Leaders for recording keeping and monitoring of their use.

SWITCHING CONTROL/COMMUNICATION
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- .23 To assure the safe and reliable operation of the Connexus electrical system, proper communication is essential.

- .24 Communication **shall** be completed over the Connexus Energy private radio system for:
- i. System Switching (3 phase circuits / sub circuits)
 - ii. Trouble Information
 - iii. Mayday
 - iv. Crew Location
- .25 Use of cell phone, text, or e-mail is not permitted for switching *unless the radio system is not available or inoperable*. Under those conditions, switching requests may be completed by cell phone with System Operations.
- a. Exception - the radio is not required for self-directed switching done by crews – however 3 way communication IS REQUIRED for self-directed switching or any related practices such as troubleshooting.
- .26 All requests and instructions shall be clearly stated, and all parties shall clearly identify themselves when initiating or terminating switching communications. If communication becomes unclear or in doubt, stop to clarify before proceeding.
- .27 3 Way Communication shall be used for all switching and related practices
- ① Message is initiated – information is communicated by the message *initiator* to the *receiver*.
 - ② Message received - the information *receiver* shall repeat back the information communicated by the *initiator*
 - ③ Message understood - after the information is repeated, the *initiator* shall acknowledge the repeated information is/was accurate to the *receiver*.
- .28 System Operations shall be involved, and authorization (“clearance”) shall be given by, for any of these activities:
- a. Prior to energizing or de-energizing substation equipment and circuits
 - b. Prior to switching sections of 3 phase circuits or sub circuits
 - c. Prior to energizing a numbered 3 phase protective device
- .29 Prior authorization is **not** required for routine switching that does not involve changing main circuit configurations or transferring load from one substation to another but **notification** to System Operations both before and after the following activities is required:
- a. Energizing or switching lateral lines for new construction
 - b. Fault isolation
 - c. Creating outages during emergency situations
 - d. Changing substation or line recloser settings to non-reclose, hot line tag, or back to normal settings
 - e. Maintenance work such as a transformer change-out
 - f. If you are in doubt, contact System Operations
- .30 System Operations shall be notified prior to, and upon completion of, routine switching
- .31 System Operations shall be notified prior to **entering** and after leaving Connexus Energy’s substations (when going inside the fence line).
- .32 System Operations shall be notified of all switching during outage restoration
- .33 Substation recloser controls (including those equipped with SCADA) **shall** be placed in the non-reclose position prior to closing. After successfully closing the recloser, the substation recloser control **shall** be put in normal operation. Some examples are:
- a. Restoring power after an outage
 - b. When bypassing for maintenance
 - c. Testing equipment and when placing into service

SUPERVISORY CONTROL AND COMMUNICATION

- .34 System Operations shall place electronic Hold card(s) in SCADA when authorized field personnel request OCR/Recloser's be set to non reclose or hot line tag.
- .35 Those Hold cards *shall* include the name of the operator, the field personnel in charge at the work site, and the date. The removal of the Hold Card and placing the circuit back to normal reclose *shall* only be done after the request of the field personnel in charge at the work site.
- .36 Opening substation recloser's by SCADA may be initiated by a request from the field or by System Operators. System Operators *shall* place electronic Hold Cards in SCADA.
- .37 Closing substation recloser's by SCADA *shall* only be initiated when requested by Connexus Energy field personnel or others authorized by the company (i.e. contractors).
- .38 When closing substation recloser's by SCADA, the field personnel *shall* make the request by stating, "*All personnel and equipment are in the clear and grounds are removed. You are clear to energize*".
- .39 The System Operators *shall* verify that it is safe to close the recloser by repeating this statement and receiving confirmation from field personnel.

Tagging for or by Other Companies

- .40 When another company requests our circuit or piece of equipment removed from service, the switching shall be done under the orders of our System Operator; and, if clearance is necessary, the tags shall be in the name of person specified by the other company.
- .41 When work is to be done by us, requiring the opening and tagging of switches controlled by another company, the switching and tagging shall be arranged through our System Operator.
- .42 When another company is working adjacent to our lines and it becomes necessary to de-energize the line, the line shall be tagged by the crew designated by our System Operator.

Low Voltage (600 Volts or Below) Utilization Circuits

- .43 When work is to be done on a low voltage utilization circuit, the circuit shall be tagged and locked out or made inoperative in accordance with Section 133, Lockout/Tagout.

220 Testing Procedures



- .01 Test areas shall be guarded:
- .02 Permanent test areas shall be guarded by walls, fences, or barriers designed to keep employees out of the test areas.
- .03 In field testing, or at a temporary test site where permanent fences and gates are not provided, one of the following means shall be used to prevent unauthorized employees from entering:
 - a. The test area shall be guarded by the use of distinctively colored safety tape that is supported approximately waist high and to which safety signs are attached.
 - b. The test area shall be guarded by a barrier or barricade that limits access to the test area to a degree equivalent, physically and visually, to the barricade specified in paragraph (1) above.
 - c. The test area shall be guarded by one or more test observers stationed so that the entire area can be monitored.
- .04 Only approved equipment shall be used when phasing the circuit or testing for polarity.
- .05 .When testing energized circuits or equipment, all temporary leads used in testing shall be adequately supported to prevent injury.

- .06 The lack of voltage on the low voltage side of a transformer shall not be considered as positive indication that the high voltage side is de-energized.
- .07 In testing for voltage, the employee shall use only an approved detector.
- .08 All temporary leads used in testing voltage from 600 volts to 15,000 volts shall be single conductor with 15,000-volt insulation. Everyone shall stand clear when making the test.
- .09 Safe grounding practices shall be followed in the test areas. Refer to Section 207, Grounding Procedures.



221 Underground Distribution

- .01 Only employees or authorized representatives of the Company shall be allowed to open a pad-mounted enclosure. When unattended, these enclosures shall be closed and locked.
- .02 Before opening any enclosure such as a live or dead- front transformer, or switching cubicle which contains exposed energized equipment, employees shall adhere to the following precautions:
 - a. The appropriate FR Clothing, Rubber gloves, eye protection and hard hat shall be worn ([See Appendix 3](#)).
 - b. Weeds, grass and other vegetation that obstructs the work shall be cleared from the area.
 - c. All loose objects which could cause an employee to stumble and fall into the energized equipment shall be removed from the area.
- .03 Door hinges of each enclosure shall be checked before it is opened. Both hands shall be used to keep positive control of the lid of the enclosure. Doors shall be blocked so that they cannot close accidentally.
- .04 Employees shall check for hazardous conditions before proceeding with work.
- .05 Before opening any enclosure, all unauthorized persons shall be required to leave the work area and stay in the clear. Where the public may be endangered, the work area shall be roped off, barricaded or otherwise marked to prevent entry.
- .06 Energized enclosures shall not be left unattended when unlocked or open.
- .07 After a transformer has been disconnected from the power source, a check shall be made for backfeed.
- .08 Cables or equipment shall be considered energized unless de-energized, tested for voltage, and grounded in accordance with approved procedures.
- .09 Before de-energizing and grounding primary cable and equipment, permission shall be obtained from System Operations in accordance with switching and tagging procedures.
- .10 Approved insulated tools shall be used to open or close energized primary switches and other primary load-breaking devices.
- .11 An approved interrupting device shall be used to open a primary load.
- .12 A bayonet fuse shall be operated by the employee at a safe position from the side of the transformer using an approved hot stick (minimum length 8') which is fully extended.
- .13 Energized elbows shall be installed and removed with an approved live line tool.
- .14 Cables which have been de-energized shall be grounded before working on them.
- .15 A primary or secondary system neutral shall not be opened on any energized circuit.
- .16 The case ground shall not be removed from an energized transformer.
- .17 When work is to be performed on de-energized equipment where it is impractical to ground on each side of the work, the cable or equipment shall be grounded in at least one location.
- .18 When installing or removing equipment, the first conductor to be connected, then the last conductor to be removed, shall be the case ground.

- .19 When it is necessary to rearrange or alter neutral conductors or shielding tape on energized circuits, a continuous metallic circuit shall be maintained with jumpers or tape. Rubber gloves shall be worn, and live line tools used.
 - .20 Due to loop characteristics of underground distribution circuits, both the top and bottom portion of primary switches shall be considered energized, until tested and grounded.
 - .21 When working on any energized cable or equipment, suitable barriers and protective covering to prevent accidental contact with other conductors or grounds shall be provided and used.
 - .22 When work is being performed in service pedestals or hand holes on energized conductors, only one conductor shall be uncovered (at a time) except when testing for voltage.
 - .23 Before energizing a service, tests shall be made for grounds and backfeed with an approved voltage tester.
 - .24 The secondary side of the current transformer shall not be opened while the primary side is energized.
 - .25 Before excavating where existing buried facilities are suspected, such facilities shall be located as accurately as practical by potholing.
- Note:** The “One-Call” service should be contacted prior to the start of digging to locate subsurface installations in the area.
- .26 Extreme care shall be exercised when digging or probing in the proximity of energized cable.
 - .27 When trenches are required to be left open, sufficient work area protection shall be placed to adequately protect the public and employees. Warning lights shall be used where trenches are left open overnight.
 - .28 Before cutting a primary cable which has been previously energized, the cable shall be isolated, tested, grounded and tagged. The cut shall be made with a cable cutters approved for severing energized cable.
 - .29 A check shall be made to assure that all grounds have been removed before equipment which has been grounded is put into service.
 - .30 If duct rods are used, they shall be installed in the direction presenting the least hazard to employees. An employee shall be stationed at the far end of the duct line being rodged to ensure that the required minimum approach distances are maintained.
 - .31 When multiple cables are present in a work area, the cable to be worked shall be identified by electrical means, unless its identity is obvious by reason of distinctive appearance or location or by other readily apparent means of identification.
 - .32 Energized cables that are to be moved shall be inspected for defects. Cables, other than the one being worked on, shall be protected from damage.
 - .33 Where a cable in a pothole has one or more abnormalities that could lead to or be an indication of an impending fault, the defective cable shall be de-energized before any employee may work in the pothole, except when service load conditions and a lack of feasible alternatives require that the cable remain energized. In that case, employees may enter the pothole provided they are protected from the possible effects of a failure by shields or other devices that are capable of containing the adverse effects of a fault in the joint.
- Note:** Abnormalities such as oil or compound leaking from cable or joints, broken cable sheaths or joint sleeves, hot localized surface temperatures of cables or joints, or joints that are swollen beyond normal tolerance are presumed to be an indication of an impending fault.
- .34 When work is performed on buried cable or on cable in manholes, metallic sheath continuity shall be maintained or the cable sheath shall be treated as energized.

222 Use and Care of Tools

- .01 Metal tapes, tapes having metal strands woven in the fabric, brass-bound rulers, metal scales and metal gauges shall not be used when working on or near energized conductors or equipment.
- .02 Hand lines shall be a minimum of one-half inch in diameter and equipped with an approved safety hook and block.
- .03 Each employee shall inspect all climbing and fall protection gear before every use.

- .04 The gaff shall not be less than one and one-quarter inches long, measured on the inside. Gaff protectors shall be used when climbers are not in use.
- .05 Tools carried in the tool belt shall be secured so that they cannot fall. Large tools shall not be carried in the tool belt.
- .06 The tool bucket shall be kept free of broken glass, broken pieces of porcelain, nails and other materials which might damage rubber gloves or other protective equipment.
- .07 Tools should not be thrown from the ground to the working position or from the working position to the ground.
- .08 Hand tools shall be inspected at least daily if they are to be used.
- .09 Insulation on tools shall not serve as a substitute for rubber gloves when the rubber glove rules require their use.
- .10 When not in use, all sharps such as pruning tools, saws, axes, etc. shall be covered with an effective sheath.
- .11 All tools shall be periodically inspected and any defective tools removed from service, regardless of ownership.
- .12 All live-line tools, insulated platforms, barriers and cover-up materials shall be inspected visually before use. Where hazardous defects are indicated, such equipment shall be removed from service.



223 Wire Stringing Operations

- .01 When in use, all pulling and tensioning equipment shall be grounded to the system neutral. Employees shall not touch this equipment unless rubber gloves are being worn, if those employees are at a different potential than the equipment.
- .02 A traveling ground, grounded to the system neutral, shall be installed between the tensioning reels and the first structure in order to ground each bare conductor during the stringing operations.
- .03 During stringing operations, each bare conductor shall be grounded at the first structure adjacent to the tensioning machine and at increments no more than **two miles** apart. Each conductor shall be grounded after it has been pulled in.
- .04 The grounds shall be left in place until the conductor installation is complete. Such grounds shall be removed as the last phase of the stringing operations.
- .05 When adjusting brakes while standing on the ground, rubber gloves shall be worn.
- .06 Rubber protective equipment shall be used if there is any possibility of induced voltage, or the wire being removed, strung, or sagged could come in contact with energized lines.
- .07 Wires or rope being pulled in or out shall not be allowed to sag to less than 18 feet over a street or highway.
- .08 Rope, lines, cables or wires hanging from poles, structures or equipment shall be tended or properly secured.
- .09 Employees shall not stand in loops of rope or wire. Employees shall not tie wire or rope around the body.
- .10 Reliable communications, through two-way radios or other equivalent means, shall be maintained between the reel tender and the pulling rig operator.



224 Working on Overhead Lines & Equipment

- .01 All circuits and equipment shall be considered energized at full voltage until de-energized, tested for voltage and grounded.
- .02 Open pole grounds shall be considered energized until a check proves otherwise. Where possibility of backfeed exists, a potential test shall be made before the conductor or equipment is considered to be de-energized.

- .03 Overhead series street lighting circuits and equipment shall be considered energized and worked as such unless they are de-energized and grounded.
- .04 Cross arm braces shall not be relied upon to support an employee's weight.
- .05 When work is being performed overhead, employees shall remain away from the base of the pole, except to assist the person doing the overhead work, and that person knows of their presence underneath them.
- .06 All equipment and tools to be used aloft shall be raised and lowered by aerial basket, hand line, canvas bucket, or other suitable container. Heavy items shall be raised by crane or hoist. Items should not be thrown or dropped.
- .07 When working along streets or highways, employees shall exercise care to keep hand lines from blowing into the lane of traffic.
- .08 When working at night, floodlights or other portable lights for emergency lighting shall be provided to perform the work safely.
- .09 The stress on a pole shall not be changed by adding or removing any conductor or guy until it is determined that the pole will withstand the altered stress.

225 Working on or Near Exposed Energized Lines or Equipment



- .01 When working in PMH switch gear, or in any enclosure with pull ring fuses, the grapppler style tool shall be used to place and remove slugged fuse doors when the cabinet is energized.
- .02 When opening cutouts with a known load of 40 amps or higher, a load buster tool shall be used. When working with unknown loads, a load buster tool is always recommended.
- .03 Only qualified employees may work on or with exposed energized lines or parts of equipment.
- .04 Only qualified employees may work in areas containing unguarded, uninsulated energized lines or parts of equipment operating at 50 volts or more.
- .05 Electric lines and equipment shall be considered and treated as energized unless they have been tested for voltage and grounded.
 - a. Except as provided below, at least two employees shall be present while the following types of work is being performed:
 - i. Installation, removal, or repair of lines that are energized at more than 600 volts.
 - ii. Installation, removal, or repair of de-energized lines if an employee is exposed to contact with other parts energized at more than 600 volts.
 - iii. Installation, removal, or repair of equipment, such as transformers, capacitors, and regulators, if an employee is exposed to contact with parts energized at more than 600 volts.
- .06 Paragraph a. does not apply to the following operations:
 - a. Routine switching of circuits, if conditions at the site allow the work to be done without exposing the employee to arc/flash hazards.
 - b. Work performed with live-line tools (hot sticks), if the employee is positioned so that he or she is outside the arc/flash boundary nor otherwise exposed to contact with energized parts.
 - c. Emergency repairs to the extent necessary to safeguard the general public from imminent danger.
- .07 Minimum Approach Distances: No employee shall approach or take any conductive object closer to; any exposed energized parts than those set forth in [Appendix 8 Minimum Approach Distances](#) unless:
 - a. The employee is insulated from the energized part. Insulating gloves or insulating sleeves (brush contact only) worn in accordance with [Section 210](#) are considered insulation of the employee.
 - b. The energized part is insulated from the employee and from any other conductive object at a different potential.

NOTE: Gloves shall be used while in an insulated aerial basket, for overhead lines over 600V

- .08 The clear hot-line tool distance shall equal or exceed the values for the indicated voltage ranges (see [Appendix 8](#)).
- .09 Employees shall wear approved Arc Rated FR clothing and PPE while working on energized lines and equipment that protects the employee from the hazardous energy present ([See Appendix 9 – FR Clothing and PPE requirements](#))
- .10 Clothing from the following types of fabrics, either alone or in blends, is prohibited: acetate, nylon, polyester, polypropylene & rayon.
- .11 Employees doing work on energized lines shall devote their undivided attention to the work at hand.
- .12 When practical, all protective equipment shall be installed with care from a level below the conductor or equipment. The removal of protective equipment shall be done with care in reverse order.
- .13 Employees working on energized lines and equipment shall position themselves below the work whenever possible.
- .14 When working on or near energized circuits on wood poles, employees shall not stand on or touch grounds or guy wires.
- .15 When two or more employees are working within reach of each other, they shall not work simultaneously on different phases or items at different potentials.
- .16 Hot line strap hoists are preferred for use on energized conductors. Chains, cables, or other metal should never be used on energized conductors.
- .17 When it is necessary to lay an energized conductor on a cross arm or pole, either the conductor shall be covered with approved insulating equipment, on the cross arm or pole shall be covered with approved protection.
- .18 A system neutral shall not be opened until the proposed opening has first been jumpered or by-passed.
- .19 Proper minimum approach distance (MAD) between the employee and the energized conductor shall be maintained unless the employee is adequately protected.
- .20 All energized conductors and equipment within reach and step potential shall be covered.
- .21 Employees shall not reach beyond the limits of the protective equipment being used.



226 Working on Downed Overhead Lines & Equipment

- .01 Downed lines and equipment shall be considered energized at full voltage and handled with proper PPE until de-energized, visibly isolated, tested for voltage, and grounded ([see Sec 208](#)).
- .02 Before beginning work, the person in charge shall take measures to protect employees and the public, identify special hazards including induced voltage and back feed, and develop a plan of action. A Job Briefing shall take place when more than one employee is doing the work.
- .03 Employees doing work on downed lines and equipment shall exercise extreme caution and devote their undivided attention to the work.
- .04 When a downed line and/or equipment is isolated from the Company's electrical circuit and customer load, and properly grounded, the line and/or equipment can be handled from the ground without properly rated rubber protective gloves.
- .05 A broken neutral conductor shall always be worked as energized, with properly rated rubber protective gloves and FR clothing.
- .06 An open enclosed mechanical protective device (e.g. OCR, sectionalizer) shall not be considered as a visible open for the purpose of isolation.



227 Work Area Protection

- .01 Guidelines for specific work area protection situations shall be followed, as described in the General Rules portion of this Safety Manual ([section 153](#)). Work area protection for traffic situations may be found in the Temporary Traffic Control Zone Layouts Field Manual ([MUCTD](#)).
- .02 Signs, and when necessary lights, shall be placed well in advance of the work area to allow the motorist time to adjust to upcoming conditions. As much advance warning shall be given as practical.
- .03 All signs shall be located on the side of the roadway and maintained at right angles to, and facing, oncoming traffic.
- .04 Only approved warning devices shall be used.
- .05 Signs shall be removed when the work has been completed. If work is temporarily suspended signs should be covered or removed.
- .06 In congested areas where there is heavy traffic, police assistance shall be requested. If police assistance is not available, traffic control devices or additional utility vehicles with appropriate emergency lighting shall be used to divert traffic away from the work area.



228 Working on Under build

01. Employees should notify Systems Operations of the transmission company they are working on an under build circuit.
02. Employees shall maintain required minimum approach distance between the transmission line and the under build – see [Appendix 8 – Clearance Chart](#).
03. The transmission line above the under build should be either de-energized or the section of line set to its lowest time current curve on the recloser when completing construction work.

Section 3

Substation Operation, Maintenance, & Construction



301 Aerial Equipment Operations

Note: In all Substation Operation, Maintenance, or Construction activities, when possible, the truck shall be connected to the system neutral when using aerial baskets. See [Section 202 Aerial Equipment Operation](#) for general rules.

- .01 In Substations a spotter must always be used to ensure the boom stays clear of lines or equipment.



302 Barricades and Barriers

- .01 When work is to be done in a de-energized bay adjacent to an energized bay, barricades shall be installed to warn against entry into the energized area.
- .02 When an addition is being constructed, barricades will be installed around the existing energized substation until the new construction is completed.
- .03 When employees are positioned on top of; structures, transformers, breakers, regulators or ladders and within reaching distance of an energized conductor or apparatus, barriers and approved protective equipment shall be used.
- .04 When working in close proximity to energized conductors or equipment, temporary barriers shall be installed to protect employees.

303 Capacitors

- .01 See [Section 135 Line Capacitors](#) for general rules. Rules in [Section 203 Line Capacitors](#) are additional for employees who routinely work on capacitors as linemen or other qualified employees.



304 Circuit Breaker Maintenance and Repair

- .01 Proper clearance shall be obtained to test or make repairs to circuit breakers in accordance with [Section 219, Switching and Tagging](#).
- .02 All parties concerned shall be instructed as to the work plan that will be followed.
- .03 When switching the breaker out for maintenance, if the circuit breaker control switch is remote from the circuit breaker, the person in charge shall place an electrical “red tag” (hold card) on the control switch.
- .04 A check shall be made to determine that all disconnects or air-break switches are in an OPEN position. The blades shall rest in the full open position.
- .05 On breakers where the energized side of the disconnects are close to the **Oil Circuit Breaker (OCB)** bushings, employees shall not climb up on top to connect the leads used for test purposes. This work shall be done from a ladder below the energized zone.
- .06 When testing an OCB for the purposes of making a test, the test equipment and the vehicle shall be grounded to the substation ground.
- .07 The case of all test transformers shall be grounded when in use, providing such cases are made of metal.
- .08 When an OCB is being operated electrically or by spring, employees shall keep hands clear of the mechanical closing mechanism.
- .09 The secondary side of an energized current transformer shall not be opened.
- .10 A ladder of the proper length shall be used when climbing up on an OCB or other equipment, so that the ladder does not reach energized conductors.
- .11 After all work has been completed on top of the equipment, a careful check shall be made to see that all tools and materials have been removed.
- .12 If it becomes necessary to climb on top of an OCB, the terminals shall be grounded.
- .13 When performing work on or near high-pressure air or gas systems extreme caution shall be exercised.



305 Fall Protection

Note: Refer to [Section 113](#), Fall Protection for general rules. This section is primarily applicable to working from a mobile anchor point or substation structure.

- .01 Fall arrest equipment, work positioning equipment, or travel restricting equipment shall be used by employees working at elevated locations more than (4') four feet above the ground unless an approved ladder, work platform, guardrail system, or a safety net system is in place.

Note: Employees undergoing training are not considered "qualified" until they have been notified by their supervisor that they are in fact qualified.

- .02 Personal fall arrest systems shall be rigged such that an employee can neither free-fall more than 2 feet nor contact any lower level. An arc rated self-retracting lifeline is required.
- .03 If a mobile anchor point is used, only one employee shall be hooked to one attachment ring on the anchor point. The number of employees hooked to the anchor point may never exceed the number of attachment rings on the anchor point.
- .04 Snap hooks may not be connected to loops made by the employee on their harness. Snap hooks may never be connected to each other.



306 Grounding Procedures

- .01 Before grounding equipment, it shall be de-energized and tested for voltage. No protective grounds shall be removed until the work has been completed and all persons involved are in the clear, except that grounds may be removed from equipment for testing purposes.
- .02 Only approved grounding devices shall be used. Before it is used, the employee shall determine that the device is in satisfactory condition. Approved live-line tools, at least **eight** feet in length shall be used for making and removing the connection to lines or equipment.
- .03 Protective grounding cable shall be flexible stranded conductors of sufficient current-carrying capacity to activate protective devices without damage to the cable, but no less than Number 2 stranded copper.
- .04 Whenever possible, a ground shall be placed on all conductors at the point of work – on both sides of the work
- .05 A system neutral or a ground wire shall not be opened until the proposed opening has first been jumpered.
- .06 When connecting new substation grounds to existing grounds, or repairing a break in an existing ground, a jumper of at least 1/0 stranded copper wire shall be used. The jumper shall be installed with rubber gloves.
- .07 The ground cable shall be connected to the ground end first and the equipment last. When removed, the grounding cable shall be disconnected from the equipment first and the ground last.
- .08 When installing grounds, employees shall stay clear of the conductor and below it, if practical.



307 Induced Voltage

Note: To guard against Induced Voltage refer to the following: [Section 306](#), Grounding Procedures; [Section 315](#), Working in Energized Substation; and [Section 318](#), Working On or Near Exposed Energized Lines or Equipment.

- .01 On de-energized lines and equipment, in the vicinity of energized high voltage stations, or where energized lines run parallel to de-energized lines, caution shall be exercised to guard against induced voltage.



308 Insulating Equipment

- .01 Insulating equipment shall be installed from a safe position, and whenever possible, from a position below the conductor or apparatus to be covered. The line or equipment nearest the employee shall be covered first. In removing insulating equipment, the equipment furthest away shall be removed first.
- .02 Climbing above exposed and energized conductors or equipment shall not be permitted.
- .03 When it is necessary to work on or near energized conductors or equipment, sufficient protective equipment shall be used to prevent accidental contact with the energized conductor or equipment.
- .04 Barriers shall be used when working adjacent to energized conductors or equipment that cannot be adequately insulated with cover-up material. When barriers are erected near energized equipment or conductors, they shall be constructed of non-conductive materials.
- .05 All protective equipment shall be maintained in satisfactory condition. When it becomes defective, it shall be replaced or sent in for repair.
- .06 Hot sticks shall be used to operate disconnect manual switches in substations. When switching, employees shall keep as far as practical from the energized equipment.
- .07 Each hot-line tool shall be visually inspected for defects before use each day and should be wiped down (preferably using a silicone wiping cloth).



309 Insulating Rubber Gloves and Rubber Sleeves

- .01 Rubber gloving practices shall follow those described in [Section 211](#), and shall never be done at Transmission voltages.



310 Regulators

- .01 When working on regulators or tap-changing transformers, care shall be exercised to see that the power is not back fed into the regulator, thus creating a primary voltage on the windings.
- .02 Before by-passing a regulator, on either single-phase or three-phase regulators, the regulator shall be in the NEUTRAL position and the control power shall be OFF.
- .03 When working on regulators or load tap changer (LTC) internal parts, they shall be de-energized.
- .04 Capacitors within the high voltage compartment, shall be shorted out before work is started.

311 Rescue Operations

General

Note: [See Appendix 6](#) for Mayday Procedures. See [Section 216](#) for rescue operations.

312 Switching and Tagging

- .01 [See section 219](#) for Distribution Switching and Tagging procedures.



313 Testing Procedures

- .01 This section includes Connexus electrical equipment maintenance shop, as well as mobile test facilities such as fault locating vehicles.
- .02 Only qualified employees shall operate high voltage test equipment. Anyone being trained shall be under the direct supervision of a qualified operator until certified as qualified.
- .03 Test areas shall be guarded:
 - a. Permanent test areas shall be guarded by walls, fences, or barriers designed to keep employees out of the test areas.
 - b. In field testing, or at a temporary test site where permanent fences and gates are not provided, one of the following means shall be used to prevent unauthorized employees from entering:
- .04 The test area shall be guarded by the use of distinctively colored markings located approximately waist high and to which safety signs describing the hazards are attached.
- .05 The test area shall be guarded by a barrier or barricade that limits access to the test area to a degree equivalent, physically and visually, to the barricade specified in paragraph (1) above.
- .06 The test area shall be guarded by one or more test observers stationed so that the entire area can be monitored and ensure that:
 - a. A pre-test safety check will be completed prior to the beginning of each series of tests;
 - b. All barriers and guards are in place
 - c. System test status signals are operable
 - d. Test power disconnects are marked and available
 - e. Ground connections are identifiable
 - f. All PPE is used as required
 - g. Signal, ground, and power cables are separated
- .07 Only approved equipment shall be used when phasing the circuit or testing for polarity.
- .08 When testing energized circuits or equipment, all temporary leads used in testing shall be adequately supported to prevent injury.
- .09 The lack of voltage on the low voltage side of a transformer shall not be considered as positive indication that the high voltage side is de-energized.
- .10 In testing for voltage, the employee shall use only an approved detector.
- .11 All temporary leads used in testing voltage from 600 volts to 15,000 volts shall be single conductor with 15,000-volt insulation. Everyone shall stand clear when making the test.
- .12 Safe grounding practices shall be followed in the test areas. Refer to [Section 306](#), Grounding Procedures. The following safe grounding procedures have been established for all test practices;
 - a. All conductive parts accessible to the test operator while at high voltage shall be maintained at ground potential excepting those that are isolated by guarding
 - b. Whenever ungrounded terminals of test equipment are present they shall be treated as energized until determined otherwise
 - c. Visible grounds shall be applied after de-energization, with properly insulated tools, before work is performed on the circuit or equipment under test. Common grounds will be solidly connected.
 - d. In high-power testing an isolated ground-return conductor system shall be provided so that no unintentional passage of current can occur in the ground grid or the earth.

Exception – an isolated ground-return conductor need not be provided if the following conditions are met:

- e. For whatever reason it is impossible to provide one. Employees must be protected from step and touch potential or the work cannot be done so suitable alternative methods must control the hazards.
- .13 When the test area is entered after equipment is de-energized, a ground shall be placed on the high-voltage terminal and any other exposed terminals.
- .14 High capacitance equipment or apparatus shall be discharged through a resistor rated for the available energy.
- .15 A direct ground shall be applied to the exposed terminals when the stored energy drops to a level at which it is safe to do so.
- .16 Mobile underground fault detecting vehicles shall be equipped with chassis grounding. Protection against hazardous touch potentials with respect to the vehicle, instrument panels, and other conductive parts accessible to employees shall be provided by bonding, insulation, or isolation.

CONTROL AND MEASURING CIRCUITS

- .17 An employee participating in the testing of equipment must adhere to the following safety practices:
- .18 Control wiring, meter connections, test leads and cables may not be run from a test area unless they are contained in a grounded metallic sheath and terminated in a grounded metallic enclosure or unless other precautions are taken that will provide equivalent protection.
- .19 Meters and other instruments with accessible terminals or parts shall be isolated from test personnel to protect against hazards arising from such terminals and parts becoming energized during testing. If locating test equipment in metal compartments with viewing windows provides this isolation, interlocks shall be provided to interrupt the power supply if the compartment cover is opened.
- .20 The routing and connections of temporary wiring shall be made secure against damage, accidental interruptions and other hazards. To the maximum extent possible, signal, control, ground, and power cables shall be kept separate.



314 Work Planning

- .01 Each day before beginning work on any equipment or structure, the person in charge shall conduct a tail-board conference at the job site with the members of the crew and in accordance with [Section 128, Job Planning](#).
- .02 Switching instructions shall be received from system operations in accordance with current Switching and Tagging procedures.
- .03 The person in charge shall be certain that each member of the crew is familiar with; the status of equipment, what part is energized, location of grounds, what the limits of the working space are, and what switches disconnect the equipment from source of supply.



315 Working in Energized Substation

- .01 When work is to be done in an energized substation, the person in charge shall determine:
 - a) That people who enter are qualified;
 - b) What equipment is energized;
 - c) What protective equipment and precautions are necessary for the safety of the employees; and
 - d) Extraordinary caution that shall be exercised in the handling of materials and equipment in the vicinity of energized equipment.

- .02 Climbing above exposed energized equipment or conductors is not permitted.
- .03 All equipment shall be considered energized at full voltage unless de-energized, tested for voltage and grounded. In a substation, special precautions shall be taken to guard against hazards of induced voltage. See [Section 307, Induced Voltage](#).
- .04 No one shall be permitted to approach or take any conductive object any closer to exposed energized parts than the [Minimum Approach Distance shown in appendix 8](#) unless:
 - a) The employee is insulated from the energized part; or
 - b) The energized part is insulated or guarded from the employee. See [Section 318, Working On Or Near Exposed Energized Lines Or Equipment](#).
- .05 Chain jacks or other restraining devices made of conductive material shall not be used on energized conductors or equipment.

When using chain jacks on de-energized conductors or equipment where accidental contact with energized equipment could be made, protective equipment shall be used.
- .06 When it is necessary to do any switching in a substation where employees are working, the person in charge shall notify the persons holding clearances in the substation, who in turn, shall notify all affected persons on their worksites.



316 Working on Overhead Structures

- .01 Before climbing ladders, scaffolds, steel structures, or other elevated structures, a thorough inspection shall be made to determine if they are safe. When there is doubt, they shall not be climbed until they are made safe by guying, bracing or other adequate means. Fall protection devices shall be used when climbing.
- .02 Employees on the ground shall stay clear of the overhead work to prevent being struck by falling objects.
- .03 Tools or materials shall not be thrown up to or down from structures or elevated work areas.
- .04 When working on elevated structures, employees shall wear a full body harness. When attaching, employees shall ensure positive attachment to the anchor point attachment ring.
- .05 No one shall be permitted under a structure which is being erected or assembled.
- .06 Tag lines shall be used to guide and handle steel or other large objects.
- .07 All fall protection equipment used in a substation shall be arc rated.

317 BLANK



318 Working on or Near Exposed Energized Lines or Equipment

- .01 Only qualified employees may work on or with exposed energized lines or parts of equipment. Only qualified employees may work in areas containing unguarded, un-insulated energized lines or parts of equipment operating at 50 volts or more.

Electric lines and equipment shall be considered (and treated) as energized unless they have been tested for voltage and grounded.
- .02 Except as provided below in item .04 below at least two employees shall be present while the following types of work are being performed:
 - a. Installation, removal, or repair of lines that are energized at more than 600 volts.

- b. Installation, removal, or repair of de-energized lines if an employee is exposed to contact with other parts energized at more than 600 volts.
- c. Installation, removal, or repair of equipment, such as transformers, capacitors, and regulators, if an employee is exposed to contact with parts energized at more than 600 volts.

Exceptions: Item .02 above **does not apply** to the following operations:

- a. Routine switching of circuits, if conditions at the site allow the work to be done without exposure to electrical contact or arc flash hazards.
 - b. Work performed with live-line tools (hot sticks), if the employee is positioned so that he or she is neither within reach of nor otherwise exposed to contact with energized parts or arc flash hazards.
 - c. Emergency repairs to the extent necessary to safeguard the general public from imminent danger.
- .03 Minimum Approach Distances: No employee shall approach or take any conductive object closer to exposed energized parts ([see Appendix 8](#)) unless:
- a. The employee is protected from the energized part (FR clothing and PPE worn in accordance with [appendix 3](#) is considered insulation of the employee).
 - b. The energized part is insulated from the employee and from any other conductive object at a different potential.
- .04 The clear live-line tool distance shall equal or exceed the values for the indicated voltage ranges.
- .05 Employees shall wear approved arc rated FR clothing and PPE in accordance with [appendix 3](#), appropriate to the energy exposure level, while working on energized lines and equipment.
- .06 **Clothing made from the following types of fabrics, either alone or in blends, is prohibited: acetate, nylon, polyester, polypropylene, and rayon.**
- .07 Employees working on energized equipment shall devote their undivided attention to the work at hand.
- .08 When two or more employees are working within reach of each other, they shall never work simultaneously on different phases or items of different potential.
- .09 Employees working on energized conductors or equipment shall work from below the energized parts whenever possible.
- .10 Employees shall insulate themselves from equipment, conductors, or attachments that may be at ground potential.
- .11 All energized parts within reach and all grounded surfaces and equipment in the immediate work area shall be covered with approved insulating devices or protected by barriers.
- .12 Parts and equipment energized at between 600 volts and 15,000 volts phase to phase shall be worked from an insulated platform or approved fiberglass ladder with 20,000-volt rubber gloves.
- .13 Parts and equipment energized at over 15,000 volts phase to phase shall be worked with approved hot-line tools.
- .14 The employee in charge shall closely supervise the work and keep the employees advised as to their personal safety and handling of the live-line tools.
- .15 Live-line tools shall be carefully inspected for defects before they are used. They shall be wiped down before use.
- .16 Each live-line tool shall be removed from service every two years and thoroughly examined for defect. If a defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is found, the stick shall be repaired and refinished or shall be permanently removed from service. If no such defect or contamination is found, the live-line tool shall be cleaned and waxed.
- .17 Proper minimum approach distance between the employee and the energized conductor shall be maintained.
- .18 Rope shall not be allowed to come in contact with energized conductors of 5 kV and above.
- .19 All energized conductors and equipment within reaching distance shall be covered.
- .20 Employees shall not reach beyond the protective equipment.

Section 4

Meter Operations



401 Aerial Devices

- .01 Aerial device operations are not typically used to maintain meters. If an aerial device is to be used (bucket truck, Versa Lift, etc.) it must be operated by a qualified employee.
- .02 [See section 202](#) for Aerial device operations safety rules and best practices.



402 Current and Potential Transformers

- .01 When necessary, instrument transformers shall be de-energized before any **repairs** are made on them.
- .02 Before starting any primary metering job, voltage checks shall be made on meter cabinets, conduits, and associated equipment to determine if they have become energized due to instrument transformer or other equipment failure.
- .03 The secondary side of a current transformer shall be properly wired or shunted before the primary side is energized.
- .04 When inserting test jacks into switchboard draw out type meters or into meter test blocks, test leads and equipment shall be checked to insure that current transformer secondary's are not open-circuited.
- .05 When an open circuit exists in the secondary of a high voltage current transformer, the current transformer shall be de-energized before the secondary is closed. If an open circuit in a low voltage current transformer secondary is encountered, 20,000-volt gloves shall be worn to close the secondary. If arcing exists, extra care shall be taken or the circuit de-energized before the secondary is closed.
- .06 All secondary connections to primary metering instrument transformers shall be visually inspected by a qualified employee before energizing. This includes checking secondary connections on pole-mounted clusters.
- .07 The absence of voltage on the low-voltage side of a voltage transformer shall not be considered positive indication that the high-voltage side is de-energized.
- .08 Before clearing a high-voltage circuit for the purpose of working thereon, all voltage transformers shall be disconnected from the circuit.



403 Fall Protection

- .01 [See Section 113](#), Fall Protection, for general rules and best practices. Fall protection is generally not necessary for meter maintenance and installations. If needed, the work must be done by an employee trained and qualified to use Fall Protection.
- .02 Fall arrest equipment, work positioning equipment, or travel restricting equipment shall be used by employees working at elevated locations more than 4 feet (4') above the ground unless an approved ladder, work platform, a guardrail system, or a safety net system is in place.



404 Insulating Equipment

- .01 Insulating equipment shall be installed from a safe position, and whenever possible, from a position below the conductor or apparatus to be covered. The line or equipment nearest the employee shall be covered first. In removing insulating equipment, the equipment furthest away shall be removed first.
- .02 Climbing is only allowed by employees who have been qualified to do so ([see section 204 Climbing Poles / Structures](#))
- .03 When it is necessary to work on or near energized conductors or equipment, sufficient protective equipment shall be used to prevent accidental contact with the energized conductor or equipment – **or the appropriate level of FR clothing and PPE is used.**
- .04 All open leads and wires shall be grounded or covered with insulating protective equipment whenever it is necessary to work around them.
- .05 Only employees specifically qualified to work on lines and equipment over 600V are allowed to do so.
- .06 When not in use, equipment shall be shielded from sunlight, heat, ozone, oil and other harmful agents and protected from physical damage from sharp or rough objects.
- .07 Blankets shall not be used on the ground without protecting them from physical damage and moisture (e.g. by means of a tarp, canvas, or other protective mats).
- .08 Flexible equipment shall always be stored in a relaxed position. Blankets, line hose and hoods shall not be stored in folded or strained positions.
- .09 Barriers shall be used when working adjacent to energized conductors or equipment that cannot be adequately insulated with cover-up material. When barriers are erected near energized equipment or conductors, they shall be constructed of non-conductive materials.
- .10 All protective equipment shall be maintained in satisfactory condition. When it becomes defective, it shall be replaced or sent in for repair.
- .11 Each live-line tool shall be properly maintained and visually inspected for defects before use each day ([see section 212 Hot Line Tool work](#)).



405 Insulating Rubber Gloves

- .01 Rubber gloves shall be worn when working on exposed energized lines or equipment energized at 50 volts or more. Rubber gloves shall also be worn when working on ungrounded lines and equipment that are subject to backfeed and induced voltage.
- .02 See section [211 Rubber Gloves and Sleeves](#) for all rules applicable for the use and care of rubber gloves.

406 Load Management Operations

- .01 This section applies to low voltage (600 volts or below) utilization circuits for the control of hazardous energy during servicing and maintenance of load management systems and equipment.
- .02 When work is to be done on a low voltage utilization circuit, the circuit shall be locked out and tagged or made inoperative in accordance with [section 133 Lockout / Tagout](#).



407 Meter Testing and Installation

- .01 Prior to starting work on a meter installation, all meter parts shall be treated as energized until tested for voltage. If a neutral or ground is disconnected, all meter parts will be treated as energized until a permanent or temporary ground is installed.
- .02 Only approved equipment shall be used in testing for voltage or in testing for polarity. Only approved tools shall be used. It is the preferred method to use a meter tool to pull and set meters.
- .03 All tools, leads, jumpers, and test equipment shall be frequently inspected. No defective tools or equipment shall be used.
- .04 When testing, one hand shall be used when possible to make connections to energized points.
- .05 Before installing a meter in a new or previously vacated meter socket, a visual check shall be made of the meter (including nameplate and meter base) and enclosure to ensure that the proper meter is being used and the equipment is in good working condition.
- .06 On all reconnects and new services, tests shall be made for backfeed, proper phasing and voltage, and grounded conductors before installing a meter.
- .07 When inserting socket-type meters into socket bases or adapters, load-side prongs shall be inserted first, then line-side. Meter removal shall be accomplished in reverse order.
- .08 When inserting a socket-type meter, the meter cover shall not be struck with the hand or other objects. Should breakage occur or exist, all broken glass shall be removed from the meter and the customer's premises and disposed of in a safe manner. Broken or cracked glass shall be removed before shipping.
- .09 Before bypassing any meter device with jumpers, a check shall be made to ensure that all electrical connections are tight and, by use of a voltage tester, ensure that the polarity of all jumpers is correct.
- .10 Extreme caution shall be used when working on or near a 277 or 480 volt meter installation.
- .11 Meters shall not be tested, installed or removed where explosive gases are suspected.
- .12 If a visual inspection of the metering installation reveals that the removal of the meter may cause a fault, no attempt shall be made to remove the meter until the service has been de-energized.
- .13 Customer loads shall be turned OFF before installing or removing meters, when it is advisable for safety reasons.
- .14 Meter socket bypass handles should not be used as service load-break devices, unless there is no other reasonable means to de-energize the meter.
- .15 If a meter socket is to be left energized, a proper meter or approved socket cover shall be installed, or other protective measures taken, including checking the load to see if the meter can be removed safely.
- .16 Portable test equipment leads shall be connected to the test equipment before energizing the test circuit.
- .17 Potential test leads and jumpers used in testing watt-hour meters shall be properly fused.
- .18 Approved fuse pullers shall be used to remove cartridge type fuses.
- .19 When removing or installing bolted-in, polyphase self-contained meter, the meter socket should be de-energized, unless approved insulated (rated) tools are being used.
- .20 Special care should be taken when setting or removing network meters so that the fifth terminal on the meter or socket is not damaged.

408 Protective Equipment (PPE)



- .01 When working on meter installations, the appropriate level of FR clothing and PPE shall be used ([see appendix 9 – FR clothing and PPE chart](#))
- .02 Approved rubber gloves shall be worn when working on energized equipment.
- .03 Arc Rated face shields shall be worn when the incident energy is above 5 cal/cm² – this includes working on energized 277/480V, 240/480V metering equipment; large wire trough installations; large group metering installations; or any time a hazardous condition exists which may cause a flash or injury to the face or eyes.
- .04 When installing or removing 277/480, 240/480V meters, an approved meter safety holder should be used.
- .05 In the shop, eye protection shall be worn while repairing, soldering, wiring meter sockets or using an air hose, and other equipment that may create a hazard to the unprotected eye.
- .06 Gloves that provide cut protection should be worn when handling an uncased meter.
- .07 To prevent contact, insulating blankets or other approved protective equipment shall be used to cover exposed energized parts.

409 Rescue Procedures

- .01 Meter operations are defined as electrically at risk and therefore employees shall be trained in First Aid and CPR.
- .02 Mayday procedure is found in [Appendix 5](#)
- .03 If an employee performing meter operations witnesses an injury, they should call 911 and follow the dispatcher's instructions. Application of First Aid and CPR is allowed, unless the employee is put at a greater risk by doing so.

410 Testing Procedures



- .01 Test areas shall be guarded:
 - a. Permanent test areas shall be guarded by walls, fences, or barriers designed to keep employees out of the test areas.
 - b. In field testing, or at a temporary test site where permanent fences and gates are not provided, one of the following means shall be used to prevent unauthorized persons from entering:
 - i. The test area shall be guarded by the use of distinctively colored safety tape that is supported approximately waist high and to which safety signs are attached.
 - ii. The test area shall be guarded by a barrier or barricade that limits access to the test area to a degree equivalent, physically and visually, to the barricade specified in paragraph (1) above.
 - iii. The test area shall be guarded by one or more observers stationed so that the entire area can be monitored.
- .02 Only approved equipment shall be used when phasing the circuit or testing for polarity.
- .03 When testing energized circuits or equipment, all temporary leads used in testing shall be adequately supported to prevent injury.
- .04 The lack of voltage on the low voltage side of a transformer shall not be considered as positive indication that the high voltage side is de-energized.
- .05 In testing for voltage, the employee shall use only an approved detector/meter.

- .06 All temporary leads used in testing voltage from 600 volts to 15,000 volts shall be single conductor with 15,000-volt insulation. Everyone shall stand clear when making the test.
- .07 Safe grounding practices shall be followed in the test areas.

411 Underground Distribution



- .01 See [section 221, Underground Distribution](#) for rules applicable to underground lines and installations.

412 Working on or Near Exposed Energized Lines or Equipment



- .01 Only qualified employees may work on or with exposed energized lines or parts of equipment.
- .02 Only qualified employees may work in areas containing unguarded, uninsulated energized lines or parts of equipment operating at 50 volts or more.
- .03 Electric lines and equipment shall be considered and treated as energized unless they have been tested for voltage and grounded.
- .04 [See Section 225 – Working on or near Exposed Energized Lines or equipment](#) for all rules governing this type of work.

413 Work Area Protection



- .01 Guidelines for specific work area protection situations shall be followed, as described in [section 102 Barricades, Barriers, and Warning Signs](#). When working with energized equipment, employees shall survey the work area and ensure any members of the public are aware of the work.

Section 5

Fleet / Warehouse

501 Cranes and Hoists



Note: Refer to [Section 110](#), Cranes and Hoists for general Crane and Hoist operations rules. Rules contained in the Fleet section are specific to Fleet equipment.

- .01 Trolley cranes must have the controls tested and attachment points inspected daily before use for the first time, and the cable run out to check for kinks or other potential issues.
- .02 All lifting straps, chains, and cables shall be properly rated for the load. Any loads with unknown weight shall be lift tested prior to performing the task. Straps, chains, and cables should have at least a 50% safety factor (rated for 150% of the load weight).



502 Forklift Operations

Note: Refer to [Section 117](#), Forklift Operations for general Forklift operations rules. Rules contained in the Fleet section are specific to Fleet equipment.

- .01 Forklifts used to move trailers or other wheeled equipment should travel in a direction that allows the operator the most control and field of vision. When vision is obscured, a spotter should be used.
- .02 When moving large wheeled trailers and mobile equipment, a means of positive attachment shall be used (bolt, cable, chain, or other securement method).



503 Material Handling

- .01 Employees shall be familiar with the Material Safety Data Sheets (MSDS) for all stored and processed materials, and comply with all special handling instructions and wear personal protective equipment as required.
- .02 Specific hand protection as required by the MSDS shall be worn when handling chemicals, or special materials. Approved work gloves shall be used when handling wire, wire rope, glass, porcelain and other materials with sharp or rough edges.
- .03 Approved safety shoes shall be worn at all times while working in storerooms or around outside storage racks and bins.
- .04 Employees shall use proper lifting techniques when handling all heavy or awkward materials, or when required to lift materials from a squatting or twisted position.
- .05 Employees shall use approved ladders, stairs, personnel lifts, or reach trucks/order pickers to retrieve materials from overhead storage. Employees shall not climb on shelves or bins to reach such materials.
- .06 Drums and barrels that contain liquids or materials shall be handled with approved mechanical equipment.
- .07 Sharp ends or edges of wire or banding material, nails, and staples shall be removed, secured, or blunted, and disposed of properly when crating or uncrating materials or equipment.
- .08 Employees shall exercise care when cutting wire. Both ends of the wire being cut shall be secured or held firmly while cutting. The end of the wire shall be securely fastened on the inside of the coil so that no sharp end protrudes.
- .09 Items shall be properly handled or passed and shall not be thrown when loading or unloading materials or equipment.
- .10 Pallet jacks and hand trucks should be pushed, not pulled. Extra care shall be exercised when maneuvering around corners or doorways, and when ascending or descending slopes. Employees shall not stand or ride on pallet jacks.
- .11 Material shall be properly stacked so as not to obstruct the vision of the operator. Loads shall be evenly distributed to prevent tipping or damaging material on the bottom of the load.
- .12 Chains, tow-bars or pull straps shall be properly secured when used to pull any skids or materials without wheels. Employees shall stand clear during pulling operations.
- .13 Shock loading (jerking) is not permitted. Tensioning and loading shall be done in a gradual, steady and safe manner.
- .14 Employees shall use approved ladders or steps when descending platforms or loading docks – jumping is prohibited except in emergency situations.

504 Material Storage

- .01 Manufacturers' Material Safety Data Sheets are readily available via the company intranet site (MSDS Online). Product labels should be kept intact on each product container, and if removed or moved to a secondary container, a suitable label replacement shall be affixed to the new container.
- .02 Racks, shelves, and bins on which material is stored shall be of substantial construction capable of supporting the weight and size of the material, located properly out of aisles and passageways, and should be secured to the floor or otherwise stabilized to prevent tipping or shifting.
- .03 Materials should be stored so that weight is evenly distributed. Material stored in higher tiers must be stored so it cannot fall or tip off of the rack, shelf, or bin.
- .04 A minimum clearance of 36 inches shall be maintained between stored material and overhead lights, sprinkler heads, and heating/cooling ducts, and fire door openings.
- .05 Poles, pipes, conduit and similar materials shall be racked or blocked to prevent shifting. Barrels, drums and reels shall be stored on end to prevent shifting, or shall be otherwise blocked to prevent rolling.
- .06 Flammable or combustible materials shall not be stored near sources of high heat, sparks or flame.
- .07 Stored materials shall not block access to electrical panels, pump controls, shut off valves, or any control panel.
- .08 The contents of all stored or staged materials shall be clearly marked and easily visible on the outside of the package. Labeling shall include the original product label or an appropriate substitute.
- .09 Heavier material should be stored on lower shelves or bins.
- .10 Cardboard boxes shall not be stacked directly on top of each other at a height greater than 48 inches.

505 Equipment Maintenance

- .01 Employees shall know and comply with the Lockout/Tagout Procedures in [Section 510](#) and as defined in Departmental Procedures.
- .02 Before working beneath raised hoods, tilted cabs or dump truck bodies, mechanical supports shall be checked to assure proper support.
- .03 No employee shall work beneath a vehicle or other piece of equipment held by a chain hoist. Such equipment shall be supported by a stand or otherwise blocked or cribbed.
- .04 Oil drippings shall be cleaned promptly and shall not be allowed to accumulate on floors or work surfaces.
- .05 Only approved cleaning fluids shall be used on floors, parts, etc.
- .06 Exhaust fumes shall be vented to the outside if it is necessary to run engines inside a closed garage for a period of more than 2 minutes.
- .07 Tools, parts, hoses, etc., should not be left in walkways where they can cause a tripping hazard.
- .08 Portable floor fans shall be equipped with a grill or mesh having openings no larger than one-half inch.
- .09 Hands shall be kept clear of all high pressure nozzles (over 30 psi) when actuated.
- .10 Use approved brake wash methods and appropriate personal protective equipment to minimize airborne dust.
- .11 Observe manufacturer's safety precautions while using brake pressure bleeders or when handling brake fluid.



506 Eye Protection

- .01 Only approved eye protection (meeting ANSI Z-87.1) that is in good condition shall be worn.

- .02 When doing work that may create sparks or slag, a hood, shield, or helmet that completely covers the face and eyes shall be worn

507 Foot Protection

- .01 Approved safety shoes or boots (meeting ASTM F 2413-05) with crush proof toe caps and non-slip soles are required as basic foot protection for all personnel who are exposed to foot hazards.
- .02 Leggings are required when welding with low-quarter boots and are highly recommended with all footwear. High top boots may be worn in lieu of leggings as long as the tops of the boots are close-fitting and covered by the pants leg or leggings while welding.



508 Hydraulics

- .01 Employees shall know and comply with the Lockout/Tagout Procedures in [Section 510](#) and [Section 133](#).
- .02 Consult manufacturer's maintenance procedures for specific instructions and warnings before attempting any hydraulic repairs.
- .03 Always neutralize (relieve) the pressure in all hydraulic systems before beginning disassembly.
- .04 Do not loosen fittings or lines when hydraulic systems are in operation or under pressure.
- .05 Air pressure shall not be used to remove or cycle the cylinder rod assembly. Only a controlled source of hydraulic pressure shall be used for hard-to-move rod assemblies.
- .06 Always use extreme care when removing plugs or any restriction from a hydraulic system suspected to have entrapped air that may be pressurized.
- .07 *Never* check for hydraulic leaks with your hand while the system is under pressure, even if wearing gloves. Oil injection injuries are potentially fatal and are frequently misdiagnosed.
- .08 Hydraulic systems with a pressurized tank shall be vented slowly before removing the cap.
- .09 Secure or block in place any component that may fall, close, or present additional hazard upon removal of any hydraulic component.

509 Hydraulic Lifts and Jacks

- .01 Only qualified and authorized persons shall operate lifts. When directing vehicles over the lifts, employees shall maintain a safe clearance from the vehicle, and be cautious of tripping hazards.
- .02 Hydraulic lift controls shall be manually operated and not blocked in the open or shut position.
- .03 Before raising a vehicle, loose equipment on the vehicle shall be secured and doors closed. Overhead clearance shall be checked before raising any large piece of equipment.
- .04 Mechanical positive locking devices shall be used, in all lifts equipped with such devices, before any work is performed under vehicles that are on lifts.
- .05 Loads should be squarely engaged, and neither the lift nor adapter shall be overloaded.
- .06 Jacks shall be securely positioned on a firm surface.
- .07 No work shall be done under a vehicle supported only by jacks. A vehicle on jacks shall be supported by adjustable stands or otherwise cribbed or blocked before work may begin.
- .08 Each jack shall have its load rating permanently and legibly marked. No jack shall be overloaded.
- .09 Every jack shall be inspected before use. Jacks that are damaged or unsatisfactory shall be tagged out-of-service, and repaired before returning to use.

.10 When jacking a vehicle up or down, wheels shall be locked or brakes applied.



510 Lockout/Tagout

Refer to [Section 133](#), Lockout / Tagout for general Lockout / Tagout rules. Rules contained in the Fleet section are specific to Fleet equipment.



Vehicular & Mobile Equipment

- .01 The authorized employee shall know the type and magnitude of energy sources that the vehicle or mobile equipment utilizes and shall understand the hazards, and the appropriate means to eliminate the hazards.
- .02 Lockout / Tagout shall be used on vehicles when unexpected start up could harm the repair personnel, bystanders, or cause damage to the vehicle.
- .03 Turn off ignition key, and battery circuit key if used, and remove key from switches. Tag the unit with the approved signed and dated "Out of Service" tag indicating the tagout is in effect and place the tag on the access to the operator's compartments or on the steering wheel.
- .04 When working on electrical systems, if secondary energy sources are present, use additional lockout procedures to controls those energy sources.
- .05 Stored energy in springs, elevated machine members, air, gas, steam, and water pressures, rotating flywheels, hydraulic systems, etc., must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, or mechanically restraining, before work can begin.
- .06 Anytime a lock is used to secure a system, it must be accompanied by a tag identifying the person that installed it, the date and time it was installed, and a means by which the employee can be contacted. At no time will any employee other than the one that tagged out the device be allowed to remove the tag and restore the vehicle or mobile equipment to use, unless following specific departmental procedures.
- .07 After the vehicle or mobile equipment is tagged out, the authorized employee should test the system by trying to activate it through normal procedures (ignition switch, start button, etc.) to assure it is safe to work on. All systems shall be reset to a NEUTRAL or OFF position after the initial test.
- .08 If it is necessary to utilize valves and/or release devices that must remain in an open or closed position during the service and/or repair procedure, they must be tagged out as well.



511 Paint, Solvents, Aerosols

Note: Refer to [Sections 137](#), Solvents, Paints, and Aerosol cans and [Section 145](#), Respiratory Protection for general rules.

512 Part Washers

- .01 Comply with all manufacturers' operating instructions when using any parts washer.
- .02 Do not reach inside a cabinet type washer with the turntable moving.
- .03 Keep the floor clean and dry around parts washers to reduce the risk of slipping or falling.
- .04 Never climb or stand on a parts washer.
- .05 Unplug or disconnect the parts washer from the power supply before attempting any maintenance.

- .06 Do not operate a parts washer if it is damaged, malfunctioning, partially disassembled, or has broken parts, including a damaged cord or plug.
- .07 Use only approved cleaning solutions in any parts washer.
- .08 *Do not* introduce toxic materials, solvents, or combustible materials with a flash point below 300 degrees into an automatic cabinet's parts washer utilizing heated water or solvent for cleaning. Flash points of products may be found by referring to the SDS.
- .09 For cabinet type washers, allow heated parts time to cool before handling.

513 Tires

- .01 Comply with all manufacturer's specifications and industry instructional materials when changing or servicing tires.
- .02 If there is known or suspected damage to the wheel, or if the tire has been run at below 80% of its recommended pressure, completely deflate the tire by removing the valve core before removing the wheel/tire from the axle.
- .03 Only use approved tire tools for dismounting and mounting tires.
- .04 A tire shall be completely deflated before dismounting from the rim.
- .05 All tires mounted on two-piece bolted rims, such as forklift tires, shall be fully deflated before removing the tire from the hub.
- .06 Tires mounted on two-piece bolted rims shall not be inflated to more than 50% of the rated psi prior to mounting on a hub.
- .07 Bent, broken, or damaged tire rims shall not be used and shall be disposed of properly.
- .08 Do not weld, heat, or braze any rim parts for any reason.
- .09 Split rims shall not be worked on. The rim should either be replaced with a single piece rim, or the work sent to a qualified vendor.
- .10 Remove rust, dirt, or corrosion from rim parts. Repaint to extend the life of the part. Approved tire lubricant shall be used to seat the beads of a tubeless tire.
- .11 The use of starting fluid, ether, gasoline, or other explosive material to lubricate, seal, or seat the beads of a tubeless tire is prohibited.
- .12 Never inflate beyond 5 psi before placing the tire/rim in an approved restraining device (cage).
- .13 Use a clip-on air chuck with gauge while inside the restraining device (cage). Do not rest or lean any part of the body against the restraining device (cage) during inflation.
- .14 Never inflate beyond inflation pressure specified on the rim or tire.
- .15 Inspect proper seating of all parts before removing from restraining device (cage).
- .16 If a tire must be changed in the field, the vehicle shall be a safe distance from passing traffic. Reflectors, flares, or other warning devices shall be used in addition to a traffic cone taper to alert oncoming traffic.
- .17 If work is to be done on a vehicle near energized lines, all instructions of a qualified person in charge shall be followed, consistent with safe work practices.
- .18 Do not use externally installed plugs to permanently repair any over the road vehicles. Internal plug patches shall be used as a permanent repair.
- .19 "Fix-A-Flat" or other tire chemical inflators shall not be used to repair or re-inflate flat tires, unless no other means exists to complete the repair safely.
- .20 Extreme caution shall be used to avoid sparks or chemical contact when dismounting a tire that has been inflated with a tire chemical inflator.



514 Batteries — UPS and Lead-Acid

Note: Refer to [Section 103](#), Batteries, for general rules associated with Batteries. Rules contained in the Fleet section are specific to Fleet equipment and operations.

- .01 The manufacturers' recommendations shall be followed when performing maintenance and/or charging such systems.
- .02 Only qualified persons shall operate and/or maintain lead-acid batteries and associated charging equipment.
- .03 Full face shield, chemical gloves, rubber apron, and chemical mono goggles shall be worn whenever maintenance or charging procedures are being performed.
- .04 Approved signs shall be posted at all entrances to and within all battery charging and maintenance areas. The signs shall read Danger — No Smoking, Open Flame or Ignition Sources.
- .05 An approved eye-wash station and/or emergency shower shall be readily identified and accessible within 25 feet of any battery maintenance area.
- .06 Ventilation to remove gases expelled from batteries shall be required in all areas where batteries are maintained. Where natural ventilation or air movement does not constantly change the air, forced ventilation shall be used.
- .07 Care shall be taken to prevent shorting of exposed battery terminal(s).
- .08 Care shall be exercised when adding/removing liquid to/from batteries to prevent spills or splashes of the liquid.
- .09 Should any liquid from batteries come in contact with skin or clothing, contaminated clothing shall be removed and skin washed as soon as possible with water.
- .10 The battery charger shall be turned OFF when practical if it is necessary to perform work in a battery room.
- .11 When charging batteries, all vent caps shall be kept in place. Care shall be exercised to ensure such vent caps are functioning properly to allow gas to escape the battery cell.
- .12 If batteries are within a cabinet/enclosure, doors and/or covers shall be opened during the charging procedure to dissipate heat and vapors.
- .13 If it becomes necessary to replace or otherwise move a battery, each battery shall be placed in a container which will protect the battery from damage.



515 Pneumatic Tools

- .01 Consult manufacturer's safe operating procedures before the use of any pneumatic tool to identify and comply with the requirement for additional personal protective equipment and safety precautions.
- .02 Only qualified persons shall operate pneumatic tools.
- .03 Eye protection is required at all times when working with or around pneumatic tools.
- .04 Hearing protection is required when working with jack hammers and other pneumatic tools that create noise levels over 75 decibels. Consult noise level survey in [Appendix 6](#).
- .05 Manufacturers' safe operating pressures for hoses, pipes, valves, filters and other fittings shall not be exceeded.
- .06 Rented or leased tools will be inspected carefully prior to use to ensure they are safe and in good operating condition.
- .07 Pneumatic tools shall never be pointed at another person.
- .08 Pneumatic tools shall be secured to the hose by positive locking device to prevent the tool from becoming accidentally disconnected.

- .09 Safety clips or retainers shall be securely installed and maintained on pneumatic tools to prevent attachments or extensions from being accidentally expelled.
- .10 Care shall be exercised to ensure the trigger or control will not operate when the tool is laid down.
- .11 The hose shall not be kinked in order to stop the tool.
- .12 Before making adjustments or changing pneumatic tools, unless equipped with quick-change connectors, air pressure shall be shut OFF at the air supply. The hose shall be bled at the tool before breaking the connection.
- .13 Conductive hoses shall not be used near exposed energized equipment.
- .14 The air tank drain valve shall be opened at regular intervals to prevent excessive moisture accumulation in the tank.
- .15 Safety relief valves are required on air tanks and shall be tested periodically to ensure proper operating condition. Relief valves shall not be tampered with or restrained.
- .16 Reducers or pressure relief devices shall be used to ensure that compressed air used for cleaning purposes is below 30 psi.
- .17 Compressed air shall not be used to blow dust and dirt from clothing or the body.
- .18 Air hoses shall not be used for hoisting or lowering tools or equipment.



516 Shop Work

- .01 All shop equipment and machinery shall only be operated according to manufacturer's safe operating procedures.
- .02 Only qualified employees shall operate or make adjustments to shop equipment and machinery.
- .03 Shop equipment and machinery shall be inspected and serviced regularly to ensure that it is working properly and can be operated safely.
- .04 Eye protection shall be worn at all times when work is being performed in the shop area. Additional eye protection is required in designated areas and for specific work.
- .05 Hearing protection shall be worn in designated shop areas while equipment or machinery is being used, and when working around specific tools and equipment requiring hearing protection.
- .06 Respiratory protection shall be worn when required.
- .07 Employees shall comply with Section 102, Barricades, Barriers and Warning Signs when performing work that extends outside the normal shop work area.
- .08 Materials shall be properly placed or stored so as not to create a hazard to employees working in or passing through the shop area.
- .09 All machine safety guards shall be kept in place except when maintenance or inspection requires removal. Shop equipment or machinery shall only be operated with safety guards properly installed.
- .10 Machines shall not be left unattended while running.
- .11 Push sticks or blocks should be used whenever possible when operating shop equipment or machinery. Hands and clothing shall be kept clear of moving parts.
- .12 Clamps should be used to hold the work securely on the work surface.
- .13 Gum, resin and loose material shall be removed immediately from saw blades and drill bits. Only sharp blades and drill bits, and well-set saws that are properly tensioned, should be used.
- .14 Employees shall comply with departmental lockout/tagout procedures whenever servicing or inspecting shop equipment.



517 Fall Protection

Note: Refer to [Section 113](#), Fall Protection for general Fall Protection rules. Rules contained in the Fleet section are specific to Fleet equipment and practices.

- .01 All “purpose built” work platforms shall be inspected before use. Any equipment that will not adequately protect against the identified fall hazard shall not be used.
- .02 Fall protection is required for any work being done at heights over four feet (4’).
- .03 For **inspection purposes only**, work on vehicles where the work exceeds 4’ but less than 6’, no fall protection is required when using the rails, platforms, and walking surfaces designed into the vehicle and adequate handholds are present. Fall protection however is strongly encouraged whenever inspection exceeds 4’ in height.
- .04 Fall protection used when welding shall be inspected immediately before and after use to ensure that no damage has occurred to the fall protection harness, lifeline, or other system components.
- .05 Only self-retracting lifelines shall be used when working on vehicles – lanyards are prohibited.

Section 6

Distribution Design



601 General

- .01 The use of the word “shall” indicates a *mandatory* practice. The word “should” indicates an *advisory* practice.
- .02 Safety of life shall outweigh all other considerations.
- .03 Any employee may stop the job if they feel the work has become imminently dangerous to a point where an injury or damage to property or equipment is likely.
- .04 Any hazardous conditions present should be shared with the customer when feasible. Use of a door tag is encouraged.
- .05 Report all hazardous conditions – when in doubt as to if it is hazardous, report it.
- .06 Employees shall report any injury, no matter how slight, as soon as is reasonably possible to their supervisor or manager.
- .07 Distribution Design employees NOT considered electrically qualified unless they have undergone specific training to qualify them. This means that they are not to come within 10’ of energized lines or exposed energized equipment.

602 Securing A Hazardous Condition Scene



- .01 **Ensure the scene is safe for you** – choose a position that does not expose you to the hazards present.

- .02 **Call System Operations** and request crew response to your location if it involves an electrical hazard immediately dangerous to life or health.
- .03 **Get assistance:**
 - a. If EMS assistance is needed immediately call 911 (i.e. injured person, explosive gas)
 - b. If company assistance is needed, contact System Operations – initiate Mayday procedure ([see appendix 5](#)) if necessary
 - c. If you need consultation or confirmation, (problem isn't apparently / immediately hazardous but you believe it may become so) you can call:
 - i. C&M Supervision
 - ii. Hazardous Conditions Coordinator
 - iii. Loss Control / Safety
- .04 **Alert / warn anyone who may be affected** by the hazard(s) as best you can without exposing yourself to the hazard(s).
- .05 **Monitor the scene** – try not to allow any unqualified / unauthorized people in, but do not place yourself at risk
- .06 **Stay at the scene** until relieved by a more senior / qualified employee OR the hazard has been adequately controlled or eliminated.
- .07 **Record the incident** via EHS Insight so we can learn from your experience. Take photos if you can, they help more fully convey what happened for learning purposes.

603 Work Site & Public Safety



- .01 Before entering any job site, a hazard assessment shall be completed. This is a short, simple task using your senses and training to identify any possible hazards present, examples including:
 - a. Slip, trip, or fall hazards
 - b. Suspicious activity
 - c. Dangerous plants or animals
 - d. Sharp edges
 - e. Exposed/Unguarded energized lines and equipment
- .02 See [Section 144](#) for Public Safety practices
- .03 See [Section 153](#) for work area protection practices
- .04 See [Section 224](#) for working around overhead lines and equipment practices
- .05 See [Section 225](#) for working near exposed energized lines and equipment practices
- .06 See [Section 315](#) for Substation Entry practices
- .07 Design employees shall not work within 10 feet of an area where unguarded or uninsulated energized lines (or equipment) is operating at 60 volts or more.
- .08 Non-qualified employees & public should maintain minimum 10' OSHA clearance from unguarded, uninsulated energized lines or parts of equipment operating at 50 volts or more, without proper PPE.
- .09 Employees on the ground shall stay clear of the overhead work to prevent being struck by falling objects.

- .10 When working on or near energized circuits on wood poles, employees shall avoid standing on or touching grounds or guy wires.



604 Dangerous Premises

01. See [Section 118](#) for general Dangerous or Hostile premise information and rules
02. If you suspect a premise as dangerous, do not enter the premise. Report your concern to your supervisor as soon as possible.
03. Any work to be done on a known or suspected **dangerous premise** (a premise you have reasonable suspicion is not safe to enter shall be discussed with a supervisor in advance to work beginning.
04. Any work done at a known **hostile premise** (customer) shall take place only after you alert law enforcement and an escort acquired.
05. If at any time you are physically threatened, call 911 – preferably from a place of safety. Report the threat as soon as possible to your Supervisor, Security, or to Loss Control.



605 Footwear/Clothing/Protective Equipment

- .01 Footwear shall cover the entire foot. Use of open toed shoes or sandals is not allowed when on a job site due to the multiple foot injury hazards encountered.
- .02 Only serviceable footwear that is in good repair and appropriate for the job shall be worn.
- .03 Only approved hard hats or caps (meeting ANSI Z - 89.1) shall be worn on construction sites or any work involving the Connexus Energy distribution system.
- .04 Head protection shall be worn by employees and non-employees under the following conditions:
- In designated hard hat areas
 - In Substations
 - At ALL construction sites where overhead hazards exist
 - At any site where falling objects **may** be present
 - By those indoors in shops and warehouses, who are subject to falling objects or overhead hazards
 - At any other area where there is a danger of head injury, inclusive of tight spaces
- .05 Employees should wear approved work gloves when handling sharp, rough, cold or heated materials or when the use of gloves will prevent hand injuries
- .06 Eye protective equipment shall be worn on jobs or in areas where hard hats are required, in all designated eye protection areas, on all jobs where it has been specified that eye protection is required, and at any time a hazard to the eye exists.
- .07 High visibility clothing meeting ANSI Class 2 or 3 (night time) shall be worn on all active construction sites, in the road right of way, or any area where vehicles or earthmoving equipment is present.

.08 Where there is potential exposure to electric shock or arc flash hazards, affected employees shall wear approved fire retardant (FR) apparel at the appropriate level of protection for the incident energy present. Reminder – unless otherwise trained and designated designers, are considered electrically unqualified and therefore shall avoid these areas.

.09 During work near (within 10') energized wire or equipment, clothing made from the following types of fabrics, either alone or in blends, is **prohibited** from wear; *acetate, nylon, polyester, rayon.*

.10 See [Section 106](#) for a complete listing of clothing, jewelry, and accessories practices

.11 [See Section 112](#) for a complete listing of eye protection practices

.12 [See Section 116](#) for a complete listing of foot protection practices

.13 [See Section 123](#) for a complete listing of head protection practices

.14 [See Section 124](#) for a complete listing of hearing protection practices



606 Driving / Motor Vehicles

.01 See [Section 150](#) for a complete list of Vehicle Operation practices.

.02 When feasible, it is recommended that parking be done so when departing the driver has a full view of the road they are entering (back in vs. back out).

.03 All employees are **prohibited** from using handheld electronic devices while driving due to the distraction they create. Cell phone calls should not be made or taken while driving. You should pull off the road to a safe position before making or taking calls.

.04 Connexus Energy employees shall not operate a motor vehicle with a known safety problem.

.05 Employees shall have a valid driver's license and current proof of insurance in their possession while operating a motor vehicle on company business.

.06 All motor vehicle accidents shall be reported to your supervisor, as is any condition(s) that may impair or negate your ability to safely or legally operate a motor vehicle.



607 Dogs / Canines

.01 If work must be performed on a premise with an aggressive animal, that animal shall be confined in such a manner that they cannot reach the employee performing the work, BEFORE the work begins.

.02 All canine bites, no matter how slight, shall be reported.

.03 If a canine bite does occur, the following are required steps:

- a. Report the bite to your supervisor or Loss Control as soon as possible.
- b. Mark the premise / customer as having an aggressive animal

.04 If a canine bite does occur, the following are highly recommended steps:

- a. Get medical attention – this may be self-administered “first aid” so long as the bite does not break the skin.

- b. Obtain immunization records from the owner for the dog
- c. Call the local police to report the bite – 911 if the animal is still loose

.05 Approved dog spray is acceptable for use under conditions where the employee believes their safety is in danger. All use of dog spray shall be reported – and the customer / premise history where it was used updated.

.06 “Dog Sticks” or umbrellas are available for staff to use when requested (from Safety)

.07 See [Section 139](#) for protocol / practices to follow if injured

.08 See [Section 155](#) for a complete listing of practices for working around animals

608 Desktop Computer Practices

- .01 .Position the top of the display screen slightly above eye level and to avoid glare on the screen.
- .02 Adjust work surfaces and space to comfortably perform work tasks within normal reach (do not have to extend elbows)
- .03 Adjust keyboard position to ensure proper position, angle, and comfort. You should keep wrists in a “neutral” position.
- .04 Take stretch breaks to alleviate or delay onset of fatigue as necessary. They are suggested every 20 minutes.
- .05 Sit upright to avoid straining neck and back.
- .06 Use a footrest if feet don’t rest comfortably on the floor.
- .07 Shift sitting position frequently to relax tension away and promote blood flow to legs.
- .08 Blink frequently. Make a conscious effort of it so your eyes won’t get dry.
- .09 See [Section 108](#) for a complete listing of all desktop computer practices.

609 Property Damage

- 01. Any incident that results in personal injury or extensive property damage to non-employees (either on Company property or in connection with Company operations) shall be immediately reported to the Supervisor who in turn shall notify Loss Control.
- 02. All incidents (that result in a collision or damage) involving Company vehicles shall be reported immediately to your manager.
- 03. All incidents of property damage to the public shall be reported within the same shift of the occurrence.

Glossary

aerial lift device – Any piece of equipment utilizing a bucket, basket or platform to place the worker(s) at an elevated worksite.

affected employee – An employee whose job requires him or her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed.

alive, live – Electrically connected to a source of potential difference or electrically charged so as to have a potential significantly different from that of earth or ground potential. The term also means “current carrying.”

anchorage – A secure means of attachment for lifelines, lanyards, and straps.

ANSI – American National Standards Institute.

approved – When used in connection with methods, tools, or equipment, refers to the methods, tools, or equipment approved by the Company through committee, departmental action, or safety rule.

Arc rated – item of protective equipment or clothing that has been tested to withstand an arc or arc blast to within the rating of the item (i.e. arc rated to 20 cal/cm² = will prevent failure of the item below the rated level)

Arc Flash tables – tables that result from arc flash calculations / study that denote the incident energy available should an arc flash occur.

attendant – An employee assigned to remain immediately outside the entrance to an enclosed or permit-required confined space to render assistance as needed to entrants inside the space.

authorized person – One who has the authority to perform specific duties under certain conditions or who is carrying out orders from responsible authority and who is knowledgeable in the construction and operation of the equipment and the hazards involved.

backfeed – To energize a section of a circuit, or a section of a power network that is supplied from a source other than its normal source. As an intended or planned work procedure, this can be done in a safe manner. When this occurs (where a circuit or section of power network is supplied from a source other than its normal source) and it is unexpected or unintended, an extremely hazardous condition can occur, for example, when a customer’s portable generator is connected to circuits that have not been isolated from the Company’s service and distribution lines.

Note: A hazardous backfeed condition can occur on lines and equipment through interconnections on transformer banks.

- barricade** – Materials such as tapes, cones, or A-frame type wood or metal structures intended to provide a *warning* about a hazardous area and to limit access to it.
- barrier** – A physical obstruction which is intended to prevent contact with energized lines or equipment or to prevent unauthorized access to a work area or restricted area.
- basket** – One component of the bucket truck and is the enclosure in which the employee stands and works aloft.
- benching, benching system** – A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
- body belt, safety belt** – A strap that both secures around the waist and attaches to a lanyard, lifeline, or strap.
- body harness** – Straps that are secured about an employee in a manner that distributes the arresting forces over at least the thighs, shoulders, and pelvis with provisions for attaching a lanyard, lifeline, or deceleration device.
- bond** – The electrical interconnection of conductive parts designed to maintain a common electrical potential.
- bucket truck** – An aerial lift and includes the entire piece of equipment: the truck, auxiliary power supply, upper boom, lower boom, controls, etc.
- bus** – A conductor or a group of conductors that serve as a common connection for two or more circuits.
- bushing** – An insulating structure, including a through-conductor or providing a passageway for such a conductor, with provision for mounting on a barrier, conducting or otherwise, for the purpose of insulating the conductor from the barrier and conducting current from one side of the barrier to the other.
- cable** – A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).
- cable sheath** – A conductive protective covering applied to cables. A cable sheath may consist of multiple layers of which one or more is conductive.
- catastrophic release** – A major uncontrolled emission, fire, or explosion involving one or more highly hazardous chemicals that presents serious danger to employees.
- chemical** – Acids, caustics, solvents and other materials and substances used in the plants and within the Company.
- circuit** – A conductor or system of conductors through which an electric current is intended to flow.
- clearance (for work)** – Authorization to perform specified work or permission to enter a restricted area or notification given that lines or equipment have been isolated from all known feed points and that the necessary switching and tagging has been completed.
- clearance (between objects)** – The clear distance between two objects measured surface to surface.
- combustible liquids** – Any liquid having a flash point at or higher than 140°F and less than 200°F.
- competent person** – One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- communication lines** – The conductors and their supporting or containing structures that are used for public or private signal or communication service. Telephone, telegraph, railroad signal, data, clock, fire, police-alarm, community television antenna, and other similar systems are included.
- conductor** – A material, usually in the form of a wire, cable, or bus bar, used for carrying an electric current.
- confined space** – A working space such as a transformer, tank, vessel, boiler, hopper or pit etc., that is large enough and so confined that an employee can bodily enter and perform assigned work; has limited or restricted means for entry or exit and is not designed for continuous human occupancy under normal operating conditions, meet the definition of a confined space. Spaces that meet this definition and contain a hazardous atmosphere or other recognized serious safety hazards (i.e. engulfment, entrapment, etc.) and may only be entered in accordance with the Permit-Required Confined Spaces Program. Similarly, enclosed spaces that cannot be safely entered must be entered under the more comprehensive Permit-Required Confined Spaces Program.

- covered conductor** — A conductor covered with a dielectric having no rated insulating strength or having a rated insulating strength less than the voltage of the circuit in which the conductor is used.
- current-carrying part** — A conducting part intended to be connected in an electric circuit to a source of voltage. Non-current-carrying parts are those not intended to be so connected.
- de-energized** — Free from any electrical connection to a source of potential difference and from electric charge; not having a potential different from that of the earth. The term is used only with reference to current-carrying parts, which are sometimes energized (alive).
- designated person** — An employee (or person) who is designated to perform specific duties and who is knowledgeable in the construction and operation of the equipment and the hazards involved. See Authorized Person.
- disconnected** — Disconnected from any electrical source of supply.
- effectively grounded** — Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages that may result in undue hazard to connected equipment or to persons.
- emergency** — An emergency occurs when an unusual condition exists that endangers life and /or property.
- employee** — A general reference to those personnel performing work or a task that are employed by the Company. Depending upon circumstances, this can also include temporary workers, contractor's workers or others.
- enclosed** — Surrounded by a case, cage, or fence, which will protect the contained equipment and prevent accidental contact of a person with live parts.
- enclosed space** — A working space, such as manhole, vault, tunnel, or shaft, that has a limited means of egress or entry, that is designed for periodic entry under operating conditions, and that under normal conditions does not contain a hazardous atmosphere, but that may contain a hazardous atmosphere under abnormal conditions.
- energized (alive, live)** — Electrically connected to a source of potential difference, or electrically charged so as to have a potential significantly different from that of earth in the vicinity.
- energy isolating device** — A physical device that prevents the transmission or release of energy, including, but not limited to, the following: a manually operated electric circuit breaker, a disconnect switch, a manually operated switch, a slide gate, a slip blind, a line valve, blocks, and any similar device with a visible indication of the position of the device. Push buttons, selector switches, and other control-circuit-type devices are not energy isolating devices.
- energy source** — Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal, or other energy source that could cause injury to personnel.
- ergonomics** — Founded in applied science, this is a process that focuses on human capabilities and limitations in the design of workstations, jobs, tools and equipment. The goal of ergonomics is to reduce or eliminate stressful body movements.
- excavations** — Any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.
- exposed** — Not isolated or guarded. A bare condition applied to objects not guarded or insulated.
- fall-arrest system** — (arrests fall from one level to another) The assemblage of equipment such as line-worker's body belt or full body harness in conjunction with a deceleration device and an anchorage to limit the forces a worker experiences during a fall from one elevation to another.
- fall prevention system** — (prevents fall from one level to another) A system intended to prevent a worker from falling from one elevation to another. Such systems include positioning devices, guardrail, barriers, and restraint systems.
- first aid providers** — Employees designated and trained to provide immediate care for injury or sudden illness until medical help arrives or medical help is obtained.
- flammable liquid** — Any liquid having a flash point less than 140°F and having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100°F.

FR – Flame retardant, will not sustain flame due to inherent or treated properties

free-fall – The act of falling before the personal fall protection system begins to arrest the fall.

ground (noun) – A conducting connection, whether intentional or accidental, between an electric circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

ground (verb) – Connecting or establishing a connection, either intentionally or accidentally, of an electric circuit or equipment to reference ground. Connect to earth or some conducting body that serves in place of earth.

ground cluster, set – A one-piece apparatus designed to ground two and three phase lines. This device must be installed with a hot stick.

grounded – Connected to earth or to some conducting body that serves in place of the earth.

grounded system – A system of conductors in which at least one conductor or point (usually the middle wire or neutral point of transformer or generator winding) is intentionally grounded, either solidly or through a current-limiting device (not a current-interrupting device).

grounding electrode, ground electrode – A conductor embedded in the earth, used for maintaining ground potential on conductors connected to it and for dissipating into the earth current conducted to it.

guarded – Protected by personnel, or covered, fenced, or enclosed by means of suitable casings, barrier rails, screens, mats, platforms, or other suitable devices in accordance with standard barricading techniques designed to prevent dangerous approach or contact by persons or objects. Wires that are insulated but not otherwise protected are not considered guarded.

hazardous atmosphere – Means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a confined or enclosed space), injury, or acute illness from one or more of the following causes:

- a. Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL).
- b. Airborne combustible dust at a concentration that meets or exceeds its LFL.

Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.

- c. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.
- d. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z of 29 CFR 1910, Toxic and Hazardous Substances, which could result in employee exposure in excess of its dose or permissible exposure limit.

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self rescue, injury, or acute illness due to its health effects is not covered by this provision.

- e. Any other atmospheric condition that is immediately dangerous to life or health.

Note: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, 29 CFR 1910.1200, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

hazard communication program – Company program to ensure that information concerning hazardous materials is transmitted to employees through the use of warnings, procedures, material safety data sheets, and employee training.

hazardous material (substances) – Any substance that is a physical hazard or a health hazard. A substance is a physical hazard when there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water reactive. The substance is a health hazard when it is determined to be a carcinogen, a toxic or highly toxic agent, a reproductive toxin, irritant, corrosive, sensitizer, hepatotoxic, nephrotoxic, neurotoxin, an agent that acts on the hematopoietic system, or an agent that damages the lungs, skin, eyes, or mucous membranes.

highly hazardous chemical – A substance possessing toxic, reactive, flammable, or explosive properties.

high power tests – Tests in which fault currents, load currents, magnetizing currents, and line-dropping currents are used to test equipment, either at the equipment's rated voltage or at lower voltages.

high voltage tests – Tests in which voltages of approximately 1000 volts are used as a practical minimum in which the voltage source has sufficient energy to cause injury.

high wind – A wind of such velocity that an employee would be exposed to being blown from elevated locations, an employee or material handling equipment could lose control of material being handled, or an employee could be exposed to other hazards. Winds exceeding 40 miles per hour or winds exceeding 30 MPH, if material handling is involved, are considered to be high winds unless precautions are taken to protect employees from the hazardous effects of the wind.

hot-line tools – Those tools and ropes that are especially designed for work on energized high voltage lines and equipment. Insulated aerial equipment especially designed for work on energized high voltage lines and equipment shall be considered hot-line.

hot work – This is an "industry term of art" which describes work done inside the standard minimum approach distance for the given voltage on the; line, structure, or equipment. If an employee is working within the approach distance; proper cover-up, rubber gloves, and rubber sleeves shall be used. At Connexus Energy, any voltage higher than 600 volts requires an insulated platform or insulated bucket / boom truck, and any energized work requires the appropriate level of flame resistant clothing, personal protective equipment, and rubber goods ([see appendix 3](#)).

Note – may also mean work involving cutting, welding, or other open flames (i.e. soldering). Ensure when the term "hot work" is used you understand the context in which it is being used.

hydrometer – An instrument for measuring the specific gravity of liquids.

incident energy – the energy available in an arc flash. The higher the incident energy the greater the level of PPE and FR needed to prevent an injury that could be caused by an arc flash

immediately dangerous to life or health (IDLH) – Means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit-required confined space.

induced voltage – The basic process of generating voltages and/or current requiring an electromagnetic field, a conductor and relative motion. This process occurs, in a practical manner, where an ungrounded conductor is in proximity to another energized (AC) conductor. The strength of the induced voltage varies directly with the distance (length) of the conductors, closeness to one another and amount of loading (current) on the energized (AC) conductor. Also can occur with electrical equipment situations and in conductive objects.

Whether a voltage is defined as being induced or generated is often simply a matter of point of view.

Note: Grounding to earth potential removes this potentially hazardous condition from occurring.

insulated – Separated from other conducting surfaces by a dielectric (including air space) offering a high resistance to the passage of current.

Note: When any object is said to be insulated, it is understood to be insulated for the conditions to which it is normally subjected. Otherwise, it is, uninsulated.

insulation (cable) – That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.

lanyard – A flexible line used to secure a body belt or body harness to a lifeline or directly to a point of anchorage.

lifeline – A line provided for direct or indirect attachment to a worker's body belt, body harness, lanyard, or deceleration device. Such lifelines may be horizontal or vertical in application.

line-clearance tree trimming – The pruning, trimming, repairing, maintaining, removing, or clearing of trees or the cutting of brush that is within 10 feet of electric supply lines and equipment.

manhole – A subsurface enclosure, which personnel may enter, that is used for installing, operating, and maintaining equipment and/or cable.

Safety Data Sheet (SDS) – *formerly known as an MSDS* A document provided by manufacturers and importers of chemicals to convey information to the users of their products. The information includes data on physical characteristics, fire and explosion hazards, reactivity, and health hazards, special precautions, and fire and spill procedures.

minimum approach distance – The closest distance an employee is permitted to approach an energized or a grounded object.

near miss – An unintended, unplanned, and unexpected event that could have, but did not result in personal injury or property damage.

oil circuit recloser or breaker (OCR or OCB) – A self-controlled device for interrupting and reclosing an alternating current circuit with a predetermined sequence of opening and reclosing.

open air – industry “term of art” that denotes the location of lines or equipment such that an arc would not be confined or directed by an enclosure (e.g. overhead lines)

pad mount – Transformer or equipment in a surface-mounted enclosure normally worked from ground level.

PCBs (polychlorinated biphenyls) – A nonconductive and noncombustible liquid used in some transformers and capacitors. It has several trade names: Pyranol, Askeral, Inerteen, etc.

personal hygiene – Habitual patterns and behaviors for any individual involving sanitary practices and cleanliness which are the principles for the preservation of health and the prevention of disease.

personal protective equipment – Any safety material or safety device worn to protect an employee from exposure to, or contact with any harmful material or force and meets applicable ANSI standards.

person in charge – In a general sense, any person, regardless of classification, who is directly in charge of a specific job or jobs.

positioning device – A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface such as a wall or pole and to work with both hands free.

primary compartment – A compartment containing voltages greater than 600 volts.

primary voltage – Any electrical circuit that normally operates at more than 600 volts.

protective system – A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

psia – Pounds per square inch absolute. The absolute, thermodynamic pressure, measured by the number of pounds-force exerted on an area of 1 square inch.

psig – Pounds per square inch gauge. The gauge pressure, measured by the number of pounds-force exerted on an area of 1 square inch.

public – Any individual not an employee or representative of the Company.

qualified employee (qualified person) – means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project **and** has been cleared by the employer to do the work.

reduced visibility – Times when normal visibility is reduced because of insufficient daylight (dawn or dusk) or adverse weather conditions such as fog or heavy rainfall.

relay vault – A substation building structure used to house protection and control relay panels, annunciators, load centers, control cable junction boxes, battery banks and other electrical apparatuses (also known as a control house).

road – The paved or unpaved surface of a roadway upon which vehicles are intended to travel. When the road is paved, the entire surface is thus included.

- roadway** – The road and the areas immediately adjacent thereto, such as the shoulder of the road, parking strip, etc. This area normally extends approximately 15 feet from the road.
- rope grab** – A device that attaches to a lifeline as an anchoring point to provide a means for arresting a fall.
- rubber gloving** – This is an “industry term of art” which describes work done by a qualified employee that is “hands-on” energized lines or equipment. If working a job that requires a “hands-on” work process, proper cover-up, proper rubber gloves and rubber sleeves shall be used. At Connexus Energy, any voltage higher than 600 volts requires an insulated platform or insulated bucket / boom truck, and any energized work requires the appropriate level of flame resistant clothing, personal protective equipment, and rubber goods ([see appendix 3](#)).
- safety can** – An approved closed container of not more than five-gallon capacity having a flash-arresting screen, spring-closing lid, and spout cover and designed so that it will safely relieve internal pressure when subjected to a fire.
- safety rule** – A positive rule requiring or requesting compliance by all employees concerned (delineated by “shall” for required, “should” for suggested). Deviation from safety rules subject to “shall” is not knowingly permitted and those cases will be subject to corrective action.
- secondary compartment** – A compartment containing voltages less than 600 volts.
- secondary voltage** – Any electrical circuit that normally operates at less than 600 volts.
- Self-retracting lifeline** – A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall
- shall** – When the word “shall” appears in the wording of a rule, it defines the statement as a requirement or obligation to do something or have something take place. The rule is to be obeyed as written. A mandatory requirement.
- shield, shield system** – A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shield structures can be permanent or portable and moved along as work progresses.
- shock absorber** – Any of several devices for absorbing the forceful energy or impact of a sudden impulse or shock load upon an object or system.
- shock load** – A hazardous condition resulting from sudden energy or load transmittal with a forceful impact with often violent and potentially shattering effects.
- shoring, shoring system** – A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.
- should** – When the word “should” appears in the wording of a rule, it defines the statement as a duty or expectation to do something or have something take place. Less stringent than “shall”, it is used to indicate advisability or prudence as well as desirability, with the same meaning as “ought to” – an advisory requirement.
- Note:** Where discretionary judgments are made in performance of an advisory rule, adequate measures shall be taken to ensure that an equivalent level of accident prevention is provided.
- sign** – An openly displayed board, placard, etc. bearing information, warning or instructions. Accident prevention signs have standard signal words or symbols, legends and colors to convey a danger, warning, caution or notice.
- sloping, sloping system** – A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surface loads.
- snap-hook** – A self-closing device with a keeper, latch, or other similar arrangement that will remain closed until manually opened. Snap hooks used for personal protection (such as fall protection) shall be of double locking design.

- step bolt** – A bolt or rung attached at intervals along a structural member and used for foot placement during climbing or standing.
- switch** – A device for opening and closing or for changing the connection of a circuit. In this section, a switch is understood to be manually operable, unless otherwise stated.
- switching operator** – A qualified person designated to operate the system or its parts. The person actually doing the switching as ordered by the switching supervisor.
- switching supervisor, system operator** – Person designated as having authority over switching and clearances of high-voltage lines and station equipment. The person under whose orders the switching is done.
- tag** – An openly displayed card, ticket, plastic marker, etc. tied or securely attached to something as a label to give information, warning or instruction. Accident prevention tags have standard signal words, symbols and colors to convey a danger, warning, caution or information.
- tailboard safety talk** – A short informal discussion of the work to be accomplished and the safety measures to be incorporated. Normally conducted by the person in charge, these discussions are sometimes referred to as tailgate talks, tool box talks, or five-minute safety talks.
- underground residential distribution (URD)** – A general term that covers the necessary facilities to furnish underground service, generally to residential and commercial customers through buried cable.
- universal precautions** – The concept of universal precautions, as an approach to infection control, means that all human blood and certain human body fluids are treated as if known to be infectious for HIV (human immunodeficiency virus), HBV (hepatitis B virus) and other bloodborne pathogens.
- unsafe conditions** – Used to indicate dangerous conditions, hazardous conditions, defective conditions, or unusual conditions that could be conducive to accidents.
- utilization circuit** – An electrical circuit and its associated equipment which utilizes (uses) electric energy for mechanical, chemical, heating, lighting or similar useful purpose. (Specifically covered under OSHA Subpart S 1910.301-1910.399). Also, defined as any electrical circuit *not* a part of power generation, transmission and distribution installations, including related equipment for the purpose of communication or metering.
- vault** – An enclosure, above or below ground, which personnel may enter and which is used for the purpose of installing, operating, or maintaining equipment or cable.
- vented vault** – A vault that has provision for air changes using exhaust flue stacks and low level air intakes operating on differentials of pressure and temperature providing for airflow which prevents a hazardous atmosphere from developing.
- voltage** – The effective potential difference between any two conductors or between a conductor and ground. The voltage specified in this manual shall mean the maximum effective voltage to which the personnel or protective equipment may be subjected. Low voltage includes voltages up to 600 volts. High voltage shall mean voltages in excess of 600 volts.
- warning signs** – Any sign or similar means of employee or public notification alerting them to an actual or possible hazard. Included are Danger signs, Caution signs, traffic protection signs, instructional signs, and informational signs.
- work area** – That area in which all work activities and equipment are confined.
- work area protection** – A system of directing and controlling traffic so as to prevent injury to our employees whose work area is adjacent to or encroaches upon one or more lanes of traffic, **or**, prevent injury to the motorist who may be forced to suddenly to adjust to unexpected road conditions.

Appendices

Appendix 1 – Heat Index Chart

Appendix 2 – Wind Chill Chart

Appendix 3 – Arc Flash Clothing guide

Appendix 4 – General Precautions – Bloodborne Pathogens

Appendix 5 – Mayday procedures

Appendix 6 – Noise Level Survey

Appendix 7 – Time Current Curve chart

Appendix 8 – Minimum Approach Distances

Appendix 9 – Vehicle out of service protocol

Appendix 1 - Heat Index Chart

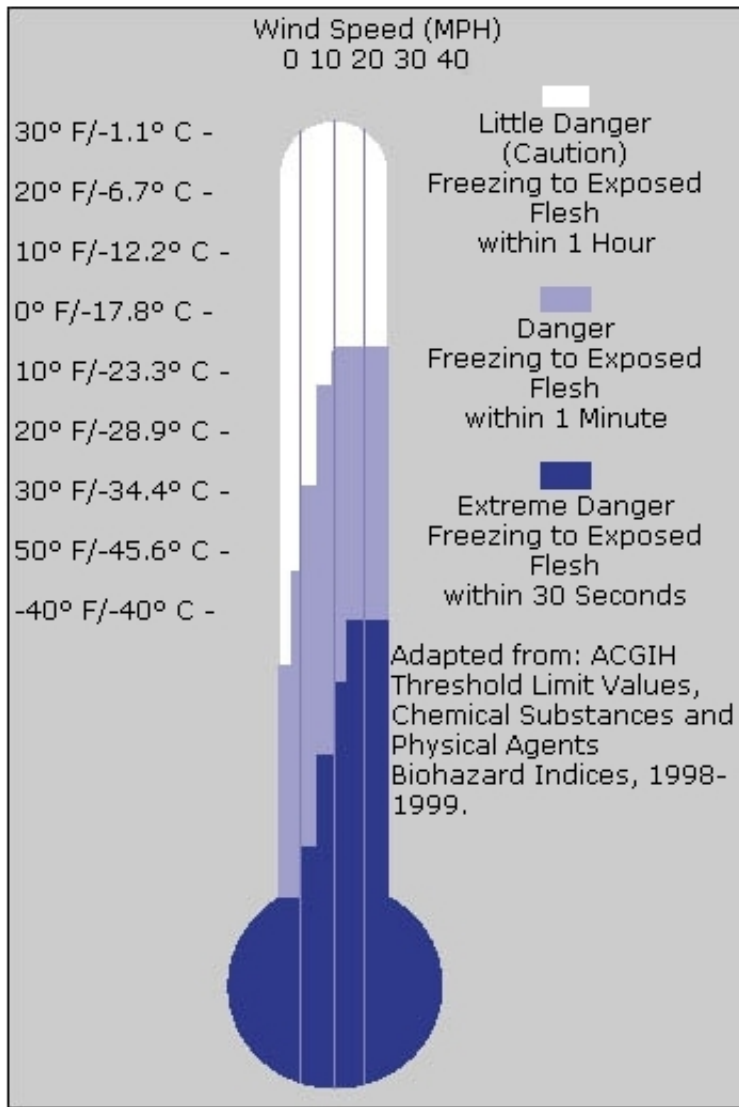
		The Heat Index									
		Environmental Temperature F° (C°)									
		80°(27)	85°(29)	90°(32)	95°(35)	100°(38)	105°(41)	110°(43)	115°(46)	120°(49)	
Relative Humidity	Apparent Temperature F° (C°)										
0%	73°(23) 78°(26)	83°(28)	87°(31)	91°(33)	95°(35)	99°(37)	103°(39)	107°(42)			
10%	75°(24) 80°(27)	85°(29)	90°(33)	95°(35)	100°(38)	105°(41)	111°(44)	116°(47)			
20%	77°(25) 82°(28)	87°(30)	93°(33)	99°(37)	105°(41)	112°(44)	120°(49)	130°(54)			
30%	78°(26) 84°(29)	90°(33)	96°(36)	104°(40)	113°(45)	123°(51)	135°(57)	148°(64)			
40%	79°(26) 86°(30)	93°(34)	101°(38)	110°(43)	123°(56)	137°(58)	151°(66)				
50%	81°(27) 88°(31)	96°(36)	107°(42)	120°(49)	136°(57)	150°(66)					
60%	82°(28) 90°(33)	100°(38)	114°(46)	132°(56)	149°(65)						
70%	85°(29) 93°(34)	106°(41)	124°(51)	144°(62)							
80%	86°(30) 97°(36)	113°(45)	136°(58)								
90%	88°(31) 102°(39)	122°(50)									
100%	91°(33) 108°(42)										

Orange - imminent danger (cease work)

Mid Yellow - likely danger (check w/ supervisor)

Yellow - danger (increase rest time)

Appendix 2 - Wind Chill chart



Appendix 3 - FR Clothing and PPE guide

Equipment / Task	Anticipated cal/cm2	Required PPE
Open air tasks and pad mount transformers	4	Long sleeve (LS) arc rated shirt & pants, Class E hard hat, rubber gloves, safety glasses
Meters / Cabinets greater than 239V, or less than 600V	20	Arc rated LS shirt & pants, Arc rated face shield & hood, Class E hard hat, rubber gloves, safety glasses, hearing protection
Primary Elbow Cabinets	Refer to Arc Flash analysis tables	<u>Minimum of</u> ; LS FR shirt, FR pants, Arc rated face shield & hood, Hard hat, rubber gloves, safety glasses, hearing protection
Substations (when changing the state of energized equipment)	Refer to Arc Flash analysis tables	<u>Minimum of</u> ; LS FR shirt, FR pants, Arc rated face shield & hood, Hard hat, rubber gloves, safety glasses, hearing protection

Appendix 4 - General Precautions / Bloodborne Pathogens

Exposure Control Plan - To help in reducing exposure in medical emergencies, each line truck first aid kit contains:

- a) Appropriate protective latex gloves and face shield or mask for performing CPR.
- b) Affected employees shall be trained in the proper techniques of CPR, first aid and Bloodborne pathogen hazards.
- c) For minor injuries, the injured or source employee should control the bleeding and handle any blood-contaminated materials as much as practical.

Pre-Exposure Vaccination - Any employee who, as part of their job duties, is required to take CPR and First Aid **may elect** to receive the hepatitis B vaccination, at no out of pocket cost (after insurance) to the employee.

Post-exposure Evaluation - All exposures should be reported **immediately** and an injury report should be completed. The following elements should be included as part of the report:

- a) Documentation of the route(s) of exposure.
- b) Circumstances under which the exposure incident occurred.
- c) Identification and information on the source individual.
- d) Names of all employees involved in giving care or treatment. At their request, any exposed employee will be provided a confidential medical evaluation at no cost.

Appendix 5 - Mayday procedures

To provide an appropriate procedure for handling **potentially life threatening situations** involving any Connexus Energy employees, or a life threatening public safety event.

- a) To initiate a MAYDAY;
 - I. Call 911 via cellular or available telephone (caller may request sysops to do)
 - II. Transmit the one word "MAYDAY" to System Operations via the mobile radio, or call in via cell phone if radio is not at hand.
- b) The System Operator shall clear the frequency by stating "clear this frequency as we have a Mayday in progress." They will then prepare to copy information by pen and paper – and state "ready to copy" back to the caller.
- c) All personnel upon hearing the mayday should:
 - I. Immediately clear the frequency and continue to monitor
 - II. Take notes in case assistance is needed.
- d) The Caller shall provide the following info:
 - I. the type of accident (i.e. injuries, severity, car, power line contact)
 - II. type of assistance needed (i.e. ambulance, fire, police, utilities)
 - III. complete & exact location including city, address, and closest intersection

The names of injured Connexus employees should only be communicated over the phone

Appendix 6 - Noise Level Survey

<u>Connexus Specific</u>		Noise Level Survey	
Noise Source	Decibels	Requires Hearing Protection	Date of Sample
SK 500 Mini Plow	93 - 100	<input checked="" type="checkbox"/>	10/1/2007
Trencher in Operation	92 - 107	<input checked="" type="checkbox"/>	5/20/2004
Truck Washing	86-95	<input checked="" type="checkbox"/>	4/19/2004
Trencher @ idle	84 - 90	<input checked="" type="checkbox"/>	5/20/2004
Back hoe in operation	82 - 96		5/8/2007
Pneumatic Tools	80 - 103	<input checked="" type="checkbox"/>	4/19/2004
Track hoe in operation	78 - 82		5/8/2007
Backhoe @ idle	71 - 78		5/8/2007
Utility truck @ idle	65 - 74		5/20/2004
Construction site background noise	60 - 88		10/1/2007
Utility truck setting pole	51 - 92	<input checked="" type="checkbox"/>	5/20/2004
Generator room	104 - 110	<input checked="" type="checkbox"/>	4/21/2008
Lawn Mower	86 - 94	<input checked="" type="checkbox"/>	5/19/2008
Geothermal pump room	80 - 83		4/21/2008
Load Bank	90 - 100	<input checked="" type="checkbox"/>	4/24/2008
Portable Generator	85 - 88	<input checked="" type="checkbox"/>	4/24/2008
Paint Booth	84 - 93	<input checked="" type="checkbox"/>	11/12/2009

Appendix 7 - Time Current Curve Chart

Fault Current	Response time Phase = 560A (133 Curve) Ground = 170A (140 Curve)	Response time Phase = 400A (133 Curve) Ground = 140A (140 Curve)
140A (ground/ imbalance)	NA / NA	NA / 28.38s
170A (ground/ imbalance)	NA / 28.38s	NA / 18.40s
400A	NA / 4.88s	14.57s / 3.70s
560A	14.57s / 3.11s	6.91s / 2.47s
600A	12.58s / 2.85s	5.96s / 2.29s
1000A	4.06s / 1.70s	2.00s / 1.47s
2000A	0.981s / 1.14s	0.537s / 1.08s
3000A	0.478s / 1.05s	0.283s / 1.04s
4000A	0.304s / 1.04s	0.187s / 1.04s
5000A	0.218s / 1.04s	0.141s / 1.04s
6000A	0.171s / 1.04s	0.114s / 1.04s
7000A	0.141s / 1.04s	0.098s / 1.04s
8000A	0.121s / 1.04s	0.088s / 1.04s

Appendix 8 – AC Hot Line Work Minimum Approach Distance (MAD) guide**2017 NESC - Table 441-1****AC Hot-Line Work Minimum Approach Distance guide**

Voltage Phase-to- Phase	Distance Phase- to- Ground	Distance Phase- to-Phase
0.00 to 0.300 kV	Avoid contact	Avoid contact
0.301 to 0.750 kV	1 ft. & 1 in	1 ft. & 1 in
.0751 to 15 kV	2 ft. & 2 in.	2 ft. & 3 in.
15.1 to 36.0 kV	2 ft. & 7 in.	3 ft.
36.1 to 46 kV	2 ft. & 10 in.	3 ft. & 3 in.
46.1 to 72.5 kV	3 ft. & 4 in.	4 ft.
72.6 to 121	3 ft. & 6 in.	4 ft. & 8 in.
138 to 145 kV	4 ft.	5 ft. & 5 in.
161 to 169 kV	4 ft. & 6 in.	6 ft. & 5 in.
230 to 242	6 ft. & 2 in.	10 ft. & 2 in.
345 to 362	10 ft. & 6 in.	18 ft. & 2 in.
500 to 550	15 ft. & 9 in.	27 ft. & 1 in.
765 to 800	21 ft. & 6 in.	37 ft. & 5 in.

Legend ft. = foot / in. = inch

Appendix 9 - Vehicle Out of Service Protocol

Connexus Fleet – Vehicle Out of Service Criteria

Any defects or violations found during inspections or normal operation of vehicles and equipment need to be documented on the “Driver’s Daily Inspection Report” and turned into Fleet Maintenance department. Fleet will determine the proper repairs and if the repair will be done internal or subcontracted. *Vehicles are to be taken out of service if any of the following conditions apply:*

- **Safety concerns** – All vehicles will be taken out of service if there is any loss of vehicle function that would create a safety risk to the operator/driver. Such examples would be vehicle stalling, lights, steering, tires, suspension, brakes etc.
- Further **Damage to the vehicle** – Vehicles will be taken out of service if the defect can cause additional damage to the vehicle if operated
- **Regulatory Compliance** – Vehicles will be taken out of service if they do not comply with all State and Federal regulations.