**Electric Power Transmission and Distribution—Procedures**

**CFR 1926 Subpart V—Electric Power Transmission and Distribution**

***Scope/Application:*** *This standard applies to the construction of electric power transmission and distribution lines and equipment. The term "construction" includes the erection of new electric transmission and distribution lines and equipment, and the alteration, conversion, and improvement of existing electric transmission and distribution lines and equipment.*

***Standard Requirements for*** [***29 CFR 1926 Subpart V***](https://www.osha.gov/laws-regs/regulations/standardnumber/1926#1926_Subpart_V)***—Electric Power Transmission and Distribution:***

* ***Procedures/Practices:*** *Emergency procedures, work procedures, work practices, line clearance operating procedures*
* ***Training:*** *Initially, each day, annually, before each job, refresher*
* ***Documentation:*** *Diligence records*

***Note:*** *Please reference 29 CFR 1926 Subpart V—Electric Power Transmission and Distribution to ensure that all requirements are being met.*

***Example Procedures:*** *The following example procedures should be modified to be site-specific to your organization. The standard does not require the procedures to be in writing. They have been put into writing as a “best practice”.*

**Electric Power Transmission and Distribution Procedures**

**Safe Work Procedures**

*Confined spaces.* We have established safe work practices for entry into and work in enclosed spaces and for rescue of employees from such spaces. In addition to procedures required in our Confined Space Program, we also require the following procedures:

* Before any entrance cover to an enclosed space is removed, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_will determine whether that it is safe to do so by checking for the presence of any atmospheric pressure or temperature differences and by evaluating whether there might be a hazardous atmosphere in the space. Any conditions making it unsafe to remove the cover will be eliminated before the cover is removed.
* When covers are removed from enclosed spaces, the opening will be promptly guarded by a railing, temporary cover, or other barrier designed to prevent an accidental fall through the opening and to protect employees working in the space from objects entering the space.
* While work is being performed in the enclosed space, an attendant with first-aid training will be immediately available outside the enclosed space to provide assistance if a hazard exists because of traffic patterns in the area of the opening used for entry. The attendant is not precluded from performing other duties outside the enclosed space if these duties do not distract the attendant from monitoring employees within the space or ensuring that it is safe for employees to enter and exit the space.
* Test instruments used to monitor atmospheres in enclosed spaces will be kept in calibration and have a minimum accuracy of ±10 percent.
* Before an employee enters an enclosed space, the atmosphere in the enclosed space will be tested for oxygen deficiency with a direct-reading meter or similar instrument, capable of collection and immediate analysis of data samples without the need for offsite evaluation. If continuous forced-air ventilation is provided, testing is not required provided that the procedures used ensure that employees are not exposed to the hazards posed by oxygen deficiency.
* Before an employee enters an enclosed space, the internal atmosphere will be tested for flammable gases and vapors with a direct-reading meter or similar instrument capable of collection and immediate analysis of data samples without the need for off-site evaluation. This test will be performed after the oxygen testing and ventilation demonstrate that there is sufficient oxygen to ensure the accuracy of the test for flammability.
* If flammable gases or vapors are detected or if an oxygen deficiency is found, forced-air ventilation will be used to maintain oxygen at a safe level and to prevent a hazardous concentration of flammable gases and vapors from accumulating.
* Continuous monitoring during confined space work to ensure that no increase in flammable gas or vapor concentration above safe levels occurs may be followed in lieu of ventilation if flammable gases or vapors are initially detected at safe levels.
* If continuous forced-air ventilation is used, it will begin before entry is made and be maintained long enough for the employer to be able to demonstrate that a safe atmosphere exists before employees are allowed to enter the work area. The forced-air ventilation will be so directed as to ventilate the immediate area where employees are present within the enclosed space and continue until all employees leave the enclosed space.
* The air supply for the continuous forced-air ventilation will be from a clean source and may not increase the hazards in the enclosed space.
* If open flames are used in enclosed spaces, a test for flammable gases and vapors will be made immediately before the open flame device is used and at least once per hour while the device is used in the space. Testing will be conducted more frequently if conditions present in the enclosed space indicate that once per hour is insufficient to detect hazardous accumulations of flammable gases or vapors.

**Training**

*Initial training.* The following will be addressed as part of initial training:

* Safety-related work practices, safety procedures, and other safety requirements that pertain to their job assignments
* Other safety practices, including applicable emergency procedures (such as pole-top and manhole rescue), and other procedures related to their work and are necessary for their safety
* Degree of training will be determined by the risk to the employee for the hazard involved
* Each employee must demonstrate proficiency in the work practices involved before being considered as having completed the required training

*Qualified employees*. Each qualified employee will also be trained and competent in:

* Skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment
* Skills and techniques necessary to determine the nominal voltage of exposed live parts
* Minimum approach distances specified in this subpart corresponding to the voltages to which the qualified employee will be exposed and the skills and techniques necessary to maintain those distances
* Proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment
* Recognition of electrical hazards to which the employee may be exposed and the skills and techniques necessary to control or avoid these hazards

*Confined space training*. Each employee that enters an enclosed space or who serves as an attendant will be trained in the hazards of enclosed-space entry, in enclosed-space entry procedures, and in enclosed-space rescue procedures. Refer to our Confined Space program.

Before each job. Each employee will be provided information that relates to the determination of existing characteristics and conditions:

* Existing characteristics and conditions of electric lines and equipment that are related to the safety of the work to be performed will be determined before work on or near the lines or equipment is started. This includes:
	+ Nominal voltages of lines and equipment
	+ Maximum switching-transient voltages
	+ Presence of hazardous induced voltages
	+ Presence of protective grounds and equipment grounding conductors
	+ Locations of circuits and equipment, including electric supply lines, communication lines, and fire protective signaling circuits
	+ Condition of protective grounds and equipment grounding conductors
	+ Condition of poles
	+ Environmental conditions relating to safety

Briefing by the employee in charge. The employee in charge will conduct a job briefing with the employees involved before they start each job. The briefing will cover at least the following subjects:

* Hazards associated with the job
* Work procedures involved
* Special precautions, energy-source controls
* Personal protective equipment requirements
* A brief discussion will be conducted if the work involved is routine and if the employees, by virtue of training and experience, can reasonably be expected to recognize and avoid the hazards involved in the job.
* A more extensive discussion will be conducted if the work is complicated or particularly hazardous, or if the employee(s) cannot be expected to recognize and avoid the hazards involved in the job.

One briefing before each day or shift. If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing will be conducted before the start of the first job of each day or shift. Typically, these briefings will be in short duration.

Additional briefings. Additional job briefings will be held if significant changes, which might affect the safety of the employees, occur during the course of the work. Typically, these briefings will be more extensive.

Working alone. An employee working alone does not conduct a job briefing. However, the supervisor will ensure that the tasks to be performed are planned as if a briefing were required.

First-aid training. When employees are performing work on, or associated with, exposed lines or equipment energized at 50 volts or more, persons with first-aid training will be available as follows:

* For field work involving two or more employees at a work location, at least two trained persons will be available
* For fixed work locations such as substations, the number of trained persons available will be sufficient to ensure that each employee exposed to electric shock can be reached within 4 minutes by a trained person
* Where the existing number of employees is insufficient to meet the above criteria (at a remote substation), each employee at the work location will be a trained employee

*Supervision and annual inspection*. Regular supervision of employees and annual inspections will be conducted to ensure that each employee is complying with the safety related work practices.

*Additional training*. An employee will receive additional training (or retraining) under any of the following conditions:

* If the supervision or annual inspections indicate that an employee is not complying with the safety-related work practices
* If new technology, new types of equipment, or changes in procedures necessitate the use of safety-related work practices that are different from those which the employee would normally use
* If the employee must employ safety related work practices that are not normally used during their regular job duties

**Inspections**

*Daily inspection*. Each live-line tool will be wiped clean and visually inspected for defects before use each day. If any defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is present after wiping, the tool will be removed from service and examined and tested before being returned to service.

*Biennial inspection and testing*. Live-line tools used for primary employee protection will be removed from service every 2 years for examination, cleaning, repair, and testing as follows:

* Each tool shall be thoroughly examined for defects
* If a defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is found, the tool will be repaired and refinished or be permanently removed from service
* If no defect or contamination is found, the tool will be cleaned and waxed
* Each tool will be tested under the following conditions:
	+ After the tool has been repaired or refinished
	+ After the examination if repair or refinishing is not performed, unless the tool is made of FRP rod or foam-filled FRP tube and we can demonstrate that the tool has no defects that could cause it to fail during use
* Test method used will be designed to verify the tool's integrity along its entire working length and, if the tool is made of fiberglass-reinforced plastic, its integrity under wet conditions
* Voltage applied during the tests will be as follows:
	+ 246,100 volts per meter (75,000 volts per foot) of length for 1 minute if the tool is made of fiberglass
	+ 164,000 volts per meter (50,000 volts per foot) of length for 1 minute if the tool is made of wood
	+ Other tests that demonstrate are equivalent

**Line-Clearance Tree Trimming** **Procedures**

Electrical hazards. To prevent electrical hazards, these procedures will be followed:

* Before an employee climbs, enters, or works around any tree, a determination will be made of the nominal voltage of electric power lines posing a hazard to employees. However, a determination of the maximum nominal voltage to which an employee will be exposed may be made instead, if all lines are considered as energized at this maximum voltage.

* Line-clearance tree trimming may not be performed when adverse weather conditions make the work hazardous in spite of our safe work practices.
* Each employee performing line-clearance tree trimming in the aftermath of a storm or under similar emergency conditions will be trained in the special hazards related to this type of work.
* Thunderstorms in the immediate vicinity, high winds, snow storms, and ice storms are examples of adverse weather conditions that are presumed to make line-clearance tree trimming too hazardous to perform safely.

Brush chippers. We will follow these procedures:

* Brush chippers will be equipped with a locking device in the ignition system.
* Access panels for maintenance and adjustment of the chipper blades and associated drive train will be in place and secure during operation of the equipment.
* Brush chippers not equipped with a mechanical infeed system will be equipped with an infeed hopper of length sufficient to prevent employees from contacting the blades or knives of the machine during operation.
* Trailer chippers detached from trucks will be chocked or otherwise secured.
* Each employee in the immediate area of an operating chipper feed table will wear personal protective equipment.

Sprayers and related equipment. We will follow these procedures:

* Walking and working surfaces of sprayers and related equipment will be covered with slip-resistant material. If slipping hazards cannot be eliminated, slip-resistant footwear or handrails and stair rails may be used instead of slip-resistant material.
* Equipment on which employees stand to spray while the vehicle is in motion will be equipped with guardrails around the working area.

Stump cutters. We will follow these procedures:

* Stump cutters will be equipped with enclosures or guards to protect employees.
* Each employee in the immediate area of stump grinding operations including the stump cutter operator) will wear personal protective equipment.

Gasoline-engine power saws. We will follow these procedures:

* Each power saw weighing more than 15 pounds, service weight, that is used in trees will be supported by a separate line, except when work is performed from an aerial lift and except during topping or removing operations where no supporting limb will be available.
* Each power saw will be equipped with a control that will return the saw to idling speed when released.
* Each power saw will be equipped with a clutch and shall be so adjusted that the clutch will not engage the chain drive at idling speed.
* A power saw be started on the ground or where it is otherwise firmly supported. Drop starting of saws over 15 pounds, other than chain saws, is permitted outside of the bucket of an aerial lift only if the area below the lift is clear of personnel.
* A power saw engine may be started and operated only when all employees other than the operator are clear of the saw.
* A power saw may not be running when the saw is being carried up into a tree by an employee.
* Power saw engines will be stopped for all cleaning, refueling, adjustments, and repairs to the saw or motor, except as the manufacturer's servicing procedures require otherwise.

Backpack power units for use in pruning and clearing. We will follow these procedures:

* While a backpack power unit is running, no one other than the operator may be within 10 feet of the cutting head of a brush saw.
* A backpack power unit will be equipped with a quick shutoff switch readily accessible to the operator.
* Backpack power unit engines will be stopped for all cleaning, refueling, adjustments, and repairs to the saw or motor, except as the manufacturer's servicing procedures require otherwise.

Rope. We will follow these procedures:

* Climbing ropes will be used by employees working aloft in trees. These ropes will have a minimum diameter of 0.5 inch with a minimum breaking strength of 2,300 pounds. Synthetic rope will have elasticity of not more than 7 percent.
* Rope will be inspected before each use and, if unsafe (for example, because of damage or defect), may not be used.
* Rope will be stored away from cutting edges and sharp tools. Rope contact with corrosive chemicals, gas, and oil will be avoided.
* When stored, rope will be coiled and piled, or shall be suspended, so that air can circulate through the coils.
* Rope ends will be secured to prevent their unraveling.
* Climbing rope may not be spliced to effect repair.
* A rope that is wet, that is contaminated to the extent that its insulating capacity is impaired, or that is otherwise not considered to be insulated for the voltage involved may not be used near exposed energized lines.

Fall protection. Each employee will be tied in with a climbing rope and safety saddle when the employee is working above the ground in a tree, unless he or she is ascending into the tree.

Microwave transmission. We will follow these procedures:

* No employee looks into an open waveguide or antenna connected to an energized microwave source.
* All areas are posted warning signs in areas where electromagnetic-radiation level within an accessible area associated with microwave communications systems exceeds the radiation-protection guide.
* We have implemented measures such as administrative and engineering controls and personal protective equipment to protect employees.

Manhole or vault access. We will follow these procedures:

* Employees will use a ladder or other climbing device to enter and exit a manhole or subsurface vault exceeding 4 feet in depth. No employee may climb into or out of a manhole or vault by stepping on cables or hangers.
* Equipment used to lower materials and tools into manholes or vaults will be capable of supporting the weight to be lowered and be checked for defects before use.
* Before anyone lowers tools or material into the opening for a manhole or vault, each employee working in the manhole or vault will be clear of the area directly under the opening.
* While work is being performed in a manhole or vault containing energized electric equipment, an employee (attendant) with first-aid training will be available on the surface in the immediate vicinity of the manhole or vault entrance to render emergency assistance.
* Occasionally, an employee on the surface may briefly enter a manhole or vault to provide nonemergency assistance.
* For the purpose of inspection, housekeeping, taking readings, or similar work, an employee working alone may enter, for brief periods of time, a manhole or vault where energized cables or equipment are in service if the employer can demonstrate that the employee will be protected from all electrical hazards.
* All employees maintain reliable communications, through two-way radios or other equivalent means, among all employees involved in the job.

Duct rods. We will follow these procedures:

* Employees will install duct rods in the direction presenting the least hazard to employees.
* An employee will be stationed at the far end of the duct line being rodded to ensure that the employees maintain the required minimum approach distances.

Multiple cables. We will follow these procedures:

* When multiple cables are present in a work area, we will the identify the cable to be worked by electrical means, unless its identity is obvious by reason of distinctive appearance or location or by other readily apparent means of identification.
* We will protect cables other than the one being worked from damage.
* Employees will inspect energized cables to be moved for abnormalities.
* Where a cable in a manhole or vault has one or more abnormalities that could lead to a fault or be an indication of an impending fault, we will deenergize the cable with the abnormality before any employee may work in the manhole or vault, except when service-load conditions and a lack of feasible alternatives require that the cable remain energized.
	+ In that case, employees may enter the manhole or vault provided the employer protects them from the possible effects of a failure using shields or other devices that are capable of containing the adverse effects of a fault.
* If the work employees will perform in a manhole or vault could cause a fault in a cable, the cable needs to be deenergized before any employee works in the manhole or vault, except when service-load conditions and a lack of feasible alternatives require that the cable remain energized. In that case, employees may enter the manhole or vault provided the employer protects them from the possible effects of a failure using shields or other devices that are capable of containing the adverse effects of a fault.

Sheath continuity. When employees perform work on buried cable or on cable in a manhole or vault, the maintain metallic-sheath continuity will be maintained, or the cable sheath shall be treated as energized.

Access and working space. We will maintain sufficient access and working space about electric equipment to permit ready and safe operation and maintenance of such equipment by employees.

Draw-out-type circuit breakers. The employer shall ensure that, when employees remove or insert draw-out-type circuit breakers, the breaker is in the open position. The employer shall also render the control circuit inoperable if the design of the equipment permits.

Substation fences. Conductive fences around substations are grounded. When a substation fence is expanded or a section is removed, fence sections will be isolated, grounded, or bonded as necessary to protect employees from hazardous differences in electric potential.

Guarding of rooms and other spaces containing electric supply equipment. Rooms and other spaces in which electric supply lines or equipment are installed under the following conditions:

* If exposed live parts operating at 50 to 150 volts to ground are within 8 feet of the ground or other working surface inside the room or other space
* If live parts operating at 151 to 600 volts to ground and located within 8 feet of the ground or other working surface inside the room or other space are guarded only by location
* If live parts operating at more than 600 volts to ground are within the room or other space, unless:
	+ All live parts are enclosed within grounded, metal-enclosed equipment whose only openings are designed so that foreign objects inserted in these openings will be deflected from energized parts
	+ All live parts are installed at a height, above ground and any other working surface, that provides protection at the voltage on the live parts corresponding to the protection provided by an 8-foot height at 50 volts
* Fences, screens, partitions, or walls will enclose the rooms and other spaces so as to minimize the possibility that unqualified persons will enter.
* Unqualified persons may not enter the rooms or other spaces while the electric supply lines or equipment are energized.
* All rooms will display signs at entrances to the rooms and other spaces warning unqualified persons to keep out.
* Each entrance to a room or other space will be locked, unless the entrance is under the observation of a person who is attending the room or other space for the purpose of preventing unqualified employees from entering.

Guarding of energized parts. We will follow these procedures:

* Guards will be maintained around all live parts operating at more than 150 volts to ground without an insulating covering unless the location of the live parts gives sufficient clearance (horizontal, vertical, or both) to minimize the possibility of accidental employee contact.
* Except for fuse replacement and other necessary access by qualified persons, guarding will be done around energized parts within a compartment during operation and maintenance functions to prevent accidental contact with energized parts and to prevent dropped tools or other equipment from contacting energized parts.
* Before guards are removed from energized equipment, barriers will be installed around the work area to prevent employees who are not working on the equipment, but who are in the area, from contacting the exposed live parts.

Substation entry. We will follow these procedures:

* Upon entering an attended substation, each employee, other than employees regularly working in the station, will report their presence to the employee in charge of substation activities to receive information on special system conditions affecting employee safety.
* A job briefing will cover information on special system conditions affecting employee safety, including the location of energized equipment in or adjacent to the work area and the limits of any deenergized work area.

**Work Related Practice for Power Generation**

Interlocks and other safety devices. We will follow these procedures:

* Interlocks and other safety devices will be maintained in a safe, operable condition.
* No interlock or other safety device may be modified to defeat its function, except for test, repair, or adjustment of the device.

Changing brushes. We will follow these procedures:

* Before exciter or generator brushes are changed while the generator is in service, the exciter or generator field will be checked to determine whether a ground condition exists.
* The brushes may not be changed while the generator is energized if a ground condition exists.

Access and working space. We will follow these procedures:

* Maintain sufficient access and working space about electric equipment to permit ready and safe operation and maintenance of such equipment by employees.

Guarding of rooms and other spaces containing electric supply equipment. We will follow these procedures:

* Rooms and other spaces in which electric supply lines or equipment are installed under the following conditions:
	+ If exposed live parts operating at 50 to 150 volts to ground are within 8 feet of the ground or other working surface inside the room or other space.
	+ If live parts operating at 151 to 600 volts to ground and located within 8 feet of the ground or other working surface inside the room or other space are guarded only by location.
	+ If live parts operating at more than 600 volts to ground are within the room or other space, unless:
		- The live parts are enclosed within grounded, metal-enclosed equipment whose only openings are designed so that foreign objects inserted in these openings will be deflected from energized parts or,
		- The live parts are installed at a height, above ground and any other working surface, that provides protection at the voltage on the live parts corresponding to the protection provided by a 2.4-meter (8-foot) height at 50 volts.
	+ Fences, screens, partitions, or walls will enclose the rooms and other spaces so as to minimize the possibility that unqualified persons will enter.
	+ Unqualified persons may not enter the rooms or other spaces while the electric supply lines or equipment are energized.
	+ Signs will be displayed at entrances to the rooms and other spaces warning unqualified persons to keep out
* The employer shall keep each entrance to a room or other space locked, unless the entrance is under the observation of a person who is attending the room or other space for the purpose of preventing unqualified employees from entering.

Guarding of energized parts. We will follow these procedures:

* Guards will be provided around all live parts operating at more than 150 volts to ground without an insulating covering unless the location of the live parts gives sufficient clearance (horizontal, vertical, or both) to minimize the possibility of accidental employee contact.
* Except for fuse replacement and other necessary access by qualified persons, we will maintain guarding of energized parts within a compartment during operation and maintenance functions to prevent accidental contact with energized parts and to prevent dropped tools or other equipment from contacting energized parts.
* Before guards are removed from energized equipment, we will shall install barriers around the work area to prevent employees who are not working on the equipment, but who are in the area, from contacting the exposed live parts.

Water or steam spaces associated with boiler. We will follow these procedures:

* A designated employee will inspect conditions before work is permitted and after its completion. Eye protection, or full face protection if necessary, will be worn at all times when condenser, heater, or boiler tubes are being cleaned.
* Where it is necessary for employees to work near tube ends during cleaning, shielding will be installed at the tube ends.

Chemical cleaning of boilers and pressure vessels. We will follow these procedures:

* Areas where chemical cleaning is in progress will be cordoned off to restrict access during cleaning.
* If flammable liquids, gases, or vapors or combustible materials will be used or might be produced during the cleaning process, the following requirements also apply:
	+ Signs will be posted restricting entry and warning of the hazards of fire and explosion.
	+ Smoking, welding, and other possible ignition sources are prohibited in these restricted areas.
	+ There will be ready access to water or showers for emergency use.
	+ Employees in restricted areas will wear protective equipment but not limited to, protective clothing, boots, goggles, and gloves.

*Coal and ash handling*. We will follow these procedures:

* Only designated persons may operate railroad equipment.
* Before a locomotive or locomotive crane is moved, a warning will be given to employees in the area.
* Employees engaged in switching or dumping cars may not use their feet to line up drawheads.
* Drawheads and knuckles may not be shifted while locomotives or cars are in motion.
* When a railroad car is stopped for unloading, the car will be secured from displacement that could endanger employees.
* An emergency means of stopping dump operations will be provided at railcar dumps.
* Employees who work in coal- or ash handling conveyor areas will be trained and knowledgeable in conveyor operation.
* Employees may not ride a coal or ash-handling conveyor belt at any time.
* Employees may not cross over the conveyor belt, except at walkways, unless the conveyor's energy source has been deenergized and has been locked out or tagged.
* A conveyor that could cause injury when started may not be started until personnel in the area are alerted by a signal or by a designated person that the conveyor is about to start.
* If a conveyor that could cause injury when started is automatically controlled or is controlled from a remote location, an audible device will be provided that sounds an alarm that will be recognized by each employee as a warning that the conveyor will start and that can be clearly heard at all points along the conveyor where personnel may be present.
* The warning device will be actuated by the device starting the conveyor and shall continue for a period of time before the conveyor starts that is long enough to allow employees to move clear of the conveyor system. A visual warning may be used in place of the audible device if it will provide an equally effective warning in the particular circumstances involved.
* Remotely and automatically controlled conveyors, and conveyors that have operating stations which are not manned or which are beyond voice and visual contact from drive areas, loading areas, transfer points, and other locations on the conveyor path not guarded by location, position, or guards will be furnished with emergency stop buttons, pull cords, limit switches, or similar emergency stop devices.
* Emergency stop devices will be easily identifiable in the immediate vicinity of such locations.
* An emergency stop device will act directly on the control of the conveyor involved and may not depend on the stopping of any other equipment.
* Emergency stop devices will be installed so that they cannot be overridden from other locations.
* Where coal-handling operations may produce a combustible atmosphere from fuel sources or from flammable gases or dust, sources of ignition will be eliminated or safely controlled to prevent ignition of the combustible atmosphere.
* An employee may not work on or beneath overhanging coal in coal bunkers, coal silos, or coal storage areas, unless the employee is protected from all hazards posed by shifting coal.
* An employee entering a bunker or silo to dislodge the contents will wear a body harness with lifeline attached. The lifeline will be secured to a fixed support outside the bunker and shall be attended at all times by an employee located outside the bunker or facility.

Chlorine systems. We will follow these procedures:

* Chlorine system enclosures will be posted with signs restricting entry and warning of the hazard to health and the hazards of fire and explosion.
* Only designated employees may enter the restricted area. Additionally, the number of personnel will be limited to those necessary to accomplish the task safely.
* Emergency repair kits will be available near the shelter or enclosure to allow for the prompt repair of leaks in chlorine lines, equipment, or containers.
* Before repair procedures are started, chlorine tanks, pipes, and equipment will be purged with dry air and isolated from other sources of chlorine.
* We will ensure that chlorine is not mixed with materials that would react with the chlorine in a dangerously exothermic or other hazardous manner.

Boilers. We will follow these procedures:

* Before internal furnace or ash hopper repair work is started, overhead areas will be inspected for possible falling objects. If the hazard of falling objects exists, overhead protection such as planking or nets shall be provided.
* When opening an operating boiler door, employees will stand clear of the opening of the door to avoid the heat blast and gases which may escape from the boiler.

Turbine generators. We will follow these procedures:

* Smoking and other ignition sources are prohibited near hydrogen or hydrogen sealing systems, and signs warning of the danger of explosion and fire will be posted.
* Excessive hydrogen makeup or abnormal loss of pressure will be considered as an emergency and be corrected immediately.
* A sufficient quantity of inert gas will be available to purge the hydrogen from the largest generator.

Capacitors. We will follow these procedures:

* Before employees work on capacitors, the capacitors will be disconnected from energized sources and short circuit the capacitors.
* The employee short circuiting the capacitors must wait at least 5 minutes from the time of disconnection before applying the short circuit,
* Before employees handle the units, each unit will be short circuited in series-parallel capacitor banks between all terminals and the capacitor case or its rack. If the cases of capacitors are on ungrounded substation racks, bond the racks to ground.
* Any line connected to capacitors will be short circuited before the line is treated as deenergized.

Protection against drowning. We will follow these procedures:

* Whenever an employee may be pulled or pushed, or might fall, into water where the danger of drowning exists, employees will be provided with U.S. Coast Guard approved personal flotation devices.
* Personal flotation devices will be provided in a safe condition and inspected frequently enough to ensure that it does not have rot, mildew, water saturation, or any other condition that could render the device unsuitable for use.
* An employee may cross streams or other bodies of water only if a safe means of passage, such as a bridge, is available.

Employee protection in public work areas. We will follow these procedures:

* Traffic-control signs and traffic-control devices used for the protection of employees.
* Before employees begin work in the vicinity of vehicular or pedestrian traffic that may endanger them, we will shall place warning signs or flags and other traffic-control devices in conspicuous locations to alert and channel approaching traffic.
* Barricades will be placed where additional employee protection is necessary.
* Warning lights will be displayed prominently at night.

**Medical Services and First Aid**

*First aid.* In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, available for the treatment of injured employees:

* We will have trained first aid providers available at the worksite to render first aid
* First aid supplies will be readily and easily accessible.
* Contents of each first aid kit will be in a weatherproof container with individual sealed packages for each type of item, and be checked by the supervisor or other responsible party before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.

*Emergency procedures*. When other than first aid is required:

* Proper equipment for prompt transportation of the injured person to a physician or hospital, or a communication system for contacting necessary ambulance service, will be provided
* In areas where 911 is not available, the telephone numbers of the physicians, hospitals, or ambulances will be posted
* Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body will be provided within the work area for immediate emergency use.
* Other:­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Free Outreach Resources:**

[*Safety and Health Programs and Plans*](https://www.labor.nc.gov/safety-and-health/publications/example-programs) *(i.e., Example Programs to be Made Site-Specific)*

[*A - Z Safety and Health Topics*](https://www.labor.nc.gov/safety-and-health/occupational-safety-and-health/occupational-safety-and-health-topic-pages) *(i.e., Learn More About Safety and Health Topics)*

[*Which Standards Apply?*](https://www.labor.nc.gov/which-osha-standards-apply) *(Identify the Standards Applicable to Your Worksite)*

[*Safety and Health Presentations*](https://www.labor.nc.gov/document-collection/osh-presentations) *(Downloadable Presentations to be Made Site-Specific)*

[*OSH Training Calendar*](https://www.labor.communications.its.state.nc.us/OSHPublic/ETTA/class_regist/calendar.cfm) *(i.e., Register for Webinars, In-Person Classroom Training, Virtual Events)*

[*Streaming Video Services*](https://www.labor.nc.gov/safety-and-health/library/how-borrow-dvds-and-videos#are-your-videos-online) *(On-Demand Training)*

[*Request Outreach Services*](https://www.labor.communications.its.state.nc.us/OSHPublic/ETTA/Outreach/Outreach_Request_Form.html) *(i.e., Request Training, Booths, Guest Speaker)*

[*AskOSH*](https://www.labor.nc.gov/safety-and-health/occupational-safety-and-health/ask-osh) *(Interpretations)*