Hampton Tedder Electric Co. Safety Manual – Rev. December 2024

Hampton Tedder adheres to Federal OSHA, Cal OSHA, the Red Book, and all requirements outlined in ISN/VeriForce/Avetta, as well as other third-party compliance platforms. Furthermore, Hampton Tedder is committed to ensuring compliance with client-specific requirements to maintain strategic alignment with our valued partners.

"No condition or sense of urgency can ever justify endangering anyone's life."

Safety can be achieved through intelligence, cooperation, and an understanding of and adherence to safety measures. It also takes the diligence of all parties at all times. Our successful safety efforts benefit not only ourselves but our co-workers, customers and the general public.

In order to be successful, the Safety Policy of this Company is designed to achieve the following:

1. Integrate safety with all company operations.
2. Provide safe working conditions, proper and adequate tools, equipment and protective devices.
3. Train employees in practices for the safe conduct of their work.
4. Enforce safety measures.

PURPOSE AND SCOPE

This Safety Manual is for your guidance in the prevention of accidents which may result in injury to you, your co-workers, the public, or damage to Company equipment or property.

The safety instructions are divided into sections:

1. General Safety
2. Electrical
3. Motor Vehicle
4. Office Safety
5. Hazardous Materials
6. Environmental
7. First Aid

No manual can cover all conditions that may arise when work is in progress. Everyone is expected to be alert and to exercise good judgment when circumstances arise that are not specifically covered. Safety manuals and codes prescribe minimum requirements and cannot be a complete working guide. Additional safety practices will be incorporated when they are considered necessary or desirable. Above all, employees are encouraged to submit safety suggestions to your immediate supervisor, safety representative or the safety committee.

FUNDAMENTALS OF SAFETY

Accident prevention can be accomplished only through wholehearted cooperation of all members of the organization. Neither management, supervision, nor the Safety Manual can prevent incidents without the help of each employee.

An unsafe worker is a danger to themselves, co-workers, the public, and the equipment with which the employee works. Care and attention to all safely rules and devices are essential, not only to prevent injury, which is paramount, but also to protect Company equipment and the tremendous investment which it represents.

A capable, mentally alert employee will avoid accidents by learning all they can about their work, using proper safeguards and protective equipment, and avoiding shortcuts and makeshift work methods and equipment.

A job done safely is a job done efficiently, and this is true of both employees and equipment. Accidents do not "just happen". Accidents are the result of unsafe conditions or unsafe practices, usually a combination of both.

Machinery and equipment generally are manufactured as perfectly as human ingenuity can conceive. In fact, statistics show that most accidents are due to the human element, such as failure to use safety devices and failure to observe safety rules and procedures.

Examples of unsafe conditions and acts which can cause accidents include the following:

- Improper Guarding: Unshielded moving parts of machines; non-barricaded floor openings and excavations; unenclosed high-voltage equipment; lack of protective equipment; insufficient warning signs; etc.
- Using unsafe equipment or Using Equipment Improperly: Using dull cutting tools, mushroom-head chisels, pipe extensions on wrenches not designed for them, the wrong tool for the job, or using hands instead of hand tools.
- Hazardous Arrangements: Arrangements due to poor housekeeping, unsafe planning, or inadequate working space as well as adjusting moving machinery, and working on or near live electrical equipment.
- Failure to Use Safe Clothing or Protective Equipment: Wearing loose sleeves, necktie or jewelry near moving machinery, failure to use rubber gloves or sleeves around energized equipment, and failure to use goggles, helmet, gas mask, respirator, gloves, apron, or leggings when necessary.
- Improper Illumination: Insufficient light, unsuitable location producing glare, or objectionable shadows.
- Improper Ventilation: Insufficient change of air or presence of harmful vapor, dust, or gas.
- Operating Without Authority or Warning: Closing switches without authority, operating hoists and trucks without warning, failure to place warning signs or signal person where needed, failure to block or guard equipment against unexpected movement.
- Operating or Working at Unsafe Speed: Driving too fast, throwing material or tools to another worker, jumping from vehicles or platform, running unnecessary haste.
- Unsafe Loading, Placing or Mixing: Overloading cranes and winches, carrying too heavy a load, leaving objects where they are likely to fall, improper packing, unsecured loads, inadequate tie- downs, combining chemicals to form a dangerous mixture.
- Taking Unsafe Position or Posture: Working on live conductors from above instead of below, walking under suspended loads or too close to openings. Lifting while in an awkward position, entering areas where there are dangerous gases or fumes, passing on curves or hills, riding on running boards or other unsafe places on vehicles.
- Distracting, Teasing or Startling: Practical joking, horseplay, quarreling or annoying.

Elimination of all unsafe conditions and unsafe practices is the only sure way to eliminate accidents.

TABLE OF CONTENTS

GENERAL SAFETY SECTION

ELECTRICAL SECTION

MOTOR VEHICLE SECTION

OFFICE SAFETY SECTION

HAZARDOUS MATERIALS SECTION

ENVIRONMENTAL

FIRST AID SECTION

ATTACHMENTS

GENERAL SAFETY SECTION

S 1. Responsibility of the Individual

- It is the individual's responsibility to act so as to provide:
  - Safety to yourself.
  - Safety to your co-worker.
  - Protection to the customer.
  - Protection to company property.
- You are expected to keep yourself fully informed of the contents of the Safety Manual and apply it to your work.
- You are expected, as part of your job, to take an active part in the Company's safety process.
- Before attempting any work under conditions which you believe are unsafe, you should call these conditions to the attention of the person in charge and get their advice.
- You shall report promptly to your supervisor any dangerous or improper condition of Company apparatus or equipment which comes to your attention.

S 2. Personal Conduct

- Every employee is expected to be alert and business-like in his/her work, courteous and considerate in all their contacts.
- Use of intoxicating liquor while on the job is prohibited. No employee shall report for work while under the influence of alcohol, and no foreman or other supervisor shall knowingly permit a worker to go to work who is under the influence of alcohol.
- Practical joking or horseplay while on the job is prohibited.
- No employee shall distract the attention of another worker from their job until it is definitely determined that no danger will result.
- Employees shall not ride on cranes, forklift trucks, side boards, coal cars, tractors, bulldozers, locomotives, or other mobile equipment except in the discharge of their duties.
- Compressed air or gas shall not be blown at a co-worker nor be used for dusting clothing or any part of the body.
- Any employee violating the foregoing requirements of personal conduct or unnecessarily endangering their own or others' personal safety shall be subject to disciplinary action up to and including termination of employment.

S 3. Physical Fitness

- Any employee, who is unable to perform their duties safely due to illness, injury or other disability, shall promptly report their condition to their immediate supervisor after absence from work due to illness or injury.
- Employees may be required to provide medical documentation to determine their fitness for duty and ability to perform the essential functions of their position.
- All injuries should receive prompt first aid attention.

S 4. Personal Protective Equipment

- Refer to your utility-specific personal protective equipment requirements in this manual.
- Goggles, face shields, or other suitable protection shall always be worn wherever there is danger of

exposing the eyes to flying particles, acids, caustic substances, harmful light rays, or any condition considered hazardous by you or your supervisor. Examples of operations which require the use of eye protection include, but are not limited to the following:

- Acetylene welding or cutting.
- Electric welding.
- Chipping, grinding, machining, or buffing.
- Drilling, cutting, or breaking masonry.
- Handling or using acids or caustics.
- Handling molten metal or slag.
- Controlling escaping gas.
- Tapping pressurized lines.
- Using pneumatic tools.

- Goggles, sunglasses or other protective eyewear shall conform to the requirements of the American Standards Association Code (Z87.1).
- Safety glasses used for protection from harmful light rays shall also meet the requirements for protection against impact hazards.
- An approved (Z89.1) hard hat (protective headgear) shall be worn by all employees when:
  - Performing work in locations where the hazards of falling or flying objects and substances are present.
  - Performing work on or near energized equipment and overhead or underground conductors.
  - Performing work in or around substations and switchyards.
  - Performing work on or near poles and other structures.
  - Performing work on or near elevated equipment, platforms, or other apparatus.
- Where protective clothing is not specifically required, employees' personal attire should conform to normal standards of propriety and personal protection.
- Where there is possible exposure to a gaseous atmosphere, static electricity, electric arcs, or harmful rays wear appropriate personal protective equipment.
- Employees shall wear footwear appropriate for the safe performance and hazards of their jobs. For employees working in the field, this shall mean hard sole boots and long pants.
- Employees shall wear appropriate protective hearing equipment.
- Employees working on or near energized equipment shall wear long pants of cotton fabric or FR rated for specific Customers.

S 5. Safety acts and precautions

- Elimination of all unsafe acts and conditions is the only sure way of preventing personal injuries. Every employee shall watch for any unsafe condition or practice and report to their supervisor any that come to their attention.
- Where a hazard cannot be removed or corrected, adequate safety precautions must be taken.

S 6. Safeguarding the Public

- Every effort should be made to protect the public at all times when Company work is in progress by the use of signs, barricades, or personal warning.
- Barricades shall be placed at all open manholes, exposed open ditches and excavations. Where necessary, open ditches and excavations should be substantially boarded over to prevent pedestrians, animals, or vehicles falling into them.

- During the night and in all dark locations, barricades with lights should be in place at any obstruction, excavation, or opening which is likely to cause injury to employees or to be the public.
- When working on customers' premises or public property, every effort shall be made to avoid hazards to persons or unnecessary property damage. All tools, equipment and excess material should be removed from the site when the job is completed.
- Smoking in Company vehicles, within Company buildings and customer's property is prohibited.
- All employees should be aware of unauthorized persons in the work area and take appropriate action if deemed necessary.

S 7. Housekeeping

- Walks, aisles, stairways, fire escapes, and all other passageways should be kept clear of all obstructions.
- Tools and materials should not be placed where they may cause tripping or stumbling hazards, or where they may fall and strike anyone below.
- All spills should be cleaned up promptly.
- Nails in boards, such as those removed from scaffolds, forms and packing boxes, should be removed.
- The boards should be carefully stacked or stored.
- Work areas should be cleaned up as soon as the job is completed and, when necessary, while the work is in progress.
- Scrap material of salvage value should be properly stored until disposed of.
- Dirty and oily waste rags shall be deposited in an appropriate metal container with a closed lid provided for that purpose, and be disposed of as soon as practical to avoid fire hazard.
- All customers' premises and Company equipment (including vehicles) shall be left in a clean and safe condition.

S 8. Fire Protection

- Good housekeeping is one of the most effective aids to fire prevention. Waste paper, rags and other combustible material should not be allowed to accumulate.
- Flammable liquids shall be kept in approved safety cans and identified by proper labels.
- Open flames and smoking are prohibited in all areas where flammable liquids or gases are stored or being used. Such areas shall be posted with appropriate warning signs.
- Avoid use of matches or open flame. Prevent electric sparks in areas where combustible gas may exist. (Such conditions may exist around gas filled electrical equipment or in manholes, vaults, battery rooms, transformer or oil circuit breaker tanks, regulator stations, odorant stations, meter sets, etc.)
- Flame or excessive heat shall not be used in close proximity to fire detecting devices or automatic sprinkler heads.
- An 18" clearance shall be maintained from all fire sprinklers.
- Firefighting equipment shall not be removed from fire stations or used for purposes other than firefighting.
- All employees should be familiar with the location and proper use of fire extinguishers in their work areas.
- To extinguish fires:
    - In ordinary combustible material such as paper, wood or rubbish, use approved "Type A"

extinguisher. Extinguishers for this purpose should be identified by "Green" colored markings.
    - In gasoline, oil or other liquids, use approved "Type B" extinguisher. Extinguishers for this purpose should be identified by "Red" colored markings.
    - In electrical equipment, use only approved "Type C" extinguisher. Extinguishers for this purpose should be identified by "Blue" colored markings.

S 9. Evacuation Information

- Assess the immediate situation for any dangers. If evacuation is required, alert the fire or police department personnel onsite to begin evacuation procedures as per the company Emergency Plan. If necessary, company personnel can implement an evacuation plan.

S 10. Material Storage

- Material stored in quantity should be arranged so that the weight is evenly distributed and not top heavy.
- All stacks and piles should be protected against overturning or other movement.
- Sand, gravel, lime, cement and other heavy material should not be stored in buildings unless the supports are designed for the additional weight.
- Barrels, drums and kegs should be stored on end or securely blocked to prevent rolling.
- Paints, varnish, lacquers and thinners are highly flammable and should be stored only in designated areas away from all possible sources of ignition.

S 11. Lifting and Carrying

- When lifting heavy objects, the back should be kept close to vertical and the lifting done with the leg muscles. Do not attempt to lift an object by yourself if it weighs more than half your weight, get help.
- Bulky loads should be carried in such a way as to permit an unobstructed view ahead.
- When two or more workers are lifting or pulling together, one worker should give the signals for this group.
- Pipes, conduits, reinforcing rods and other conducting material should not be carried on the shoulders near exposed live electrical equipment or conductors.

S 12. Forklift Trucks

- Only the certified driver wearing a seatbelt should ride on motor-driven lift trucks unless otherwise designed to carry a passenger.
- Lift trucks shall be operated at speeds which are safe for existing conditions.
- Approach blind corners, doors and intersections cautiously and sound the horn.
- Loads should be picked up near the center of their weight.
- Loose material should be secured to prevent shifting or toppling while in motion.
- Employees shall not be lifted from one elevation to another by a forklift truck unless it is equipped with an approved platform with railing and toe boards securely fastened to the forks.
- When not in use, the forks or platform should be in the lowered position.

S 13. Rigging and Hoisting

- Chain hoists, derricks, cranes and other hoisting equipment shall be inspected at regular intervals. In no case shall such equipment be used until it has been determined that is free from defects and safe to use.

- Any hoisting equipment found defective should be immediately tagged as unsafe and not used until repaired.
- Be certain that the hoist is properly hung and that the supporting member will carry the load. Before the load is lifted, a strain should be taken on the cable and the hitch rechecked.
- When there is danger of the load being suddenly release, or if the chain hoist is suspended from a long cable, the hooks should be snubbed with wire or shackles.
- Before operating crane, derrick or other hoisting equipment, the operator should sound a warning and accept only one person's signal to start raising, lowering or swinging load. However, the operator shall stop immediately upon signal from anyone.
- When operating a crane (locomotive, caterpillar or truck-mounted) near energized lines or equipment, its boom, cables or load shall not come closer to unprotected conductors than twice the length of the insulator supporting the conductor.
- Before moving a crane in close proximity to overhead electric lines, the boom shall be lowered sufficiently to provide ample clearance.
- When making heavy lifts, outriggers or rail clamps should be used to prevent overturning.
- Extreme caution shall be used when working near cables or ropes under tension. Never place yourself within the angle formed by ropes or cables under tension. When anyone is in this or other dangerous positions, the hoist operator shall never place tension on a rope or cable.
- Employees shall familiarize themselves with the proper knots, ties and hitches, safe working load for ropes, cables, slings and fittings, and proper methods of hooking and slinging required in their work. http://www.animatedknots.com
- Particular care must be exercised to see that cables, chains and other hoisting equipment are not unduly stressed by improper use. All ropes, cables, chains, slings, etc. shall be discarded when they have worn or deteriorated to the point where their safe use may be questionable in the judgment of the foreman.
- Chains shall not be spliced or joined by makeshift means such as open links, bolts, or wire. New links shall be inserted by some competent person, or the chain returned to the manufacturer for repairs.
- Wire ropes or cables should not be allowed to kink as this weakens them. Protective pads shall be used where cables are wrapped around sharp objects or corners.
- When applying U-bolt clips to cable, a sufficient number should be used and the bases should bear on the pulling side of the loop.
- The rating of hooks, rings, clevises, and other fittings used on chains or cables shall exceed the carrying capacity of the chain or cable.
- Fiber rope shall be properly cared for to retain its strength and lasting quality. The following precautions will preserve the strength and life of rope:
    - Where a rope sling passes over sharp edges, pads shall be used to protect the fibers against cutting and undue stress.
    - Do not drag rope on the ground unnecessarily as dirt charges the fibers.
    - Do not use too small a sheave.
    - Do not use sheaves with rough surfaces or broken edges.
    - Do not let rope slip on winch drum or lie idle on moving drum. Do not place kinked rope under stress.
    - Do not allow rope to unravel; finish the ends. Do not tie knots where splices should be used.
    - Do not allow ropes to become oil soaked or exposed to acid or corrosive substances. Do

not allow rope to remain dirty or gritty. Wash and dry.
  - Do not allow rope to remain exposed to weather any more than necessary.
  - Carefully dry rope when it becomes wet.
  - Do not use excessive heat when drying rope.
  - Do not allow wet rope to freeze.

S 14. Ladders, Scaffolds and Boatswain's (Bosun) Chairs

- All wood ladders shall be inspected at regular intervals and maintained to conform to ANSI, state, and Company specifications.
- Ladders made of fiberglass; epoxy or other synthetic material shall equal or exceed the strength requirement of approved wood ladders.
- Portable metal ladders shall not be used unless specifically authorized.
- Wood ladders should be given a suitable protective coating such as clear varnish or linseed oil. Metallic paint shall not be used on wood ladders. A paint which hides the grain shall not be used because it hinders detection of defects.
- When a ladder has fallen or been struck, it should be carefully examined for possible damage before being used.
- Damaged ladders shall be destroyed or cut to shorter length.
- All portable ladders shall be equipped with suitable safety feet. Where safety feet do not overcome the hazard of slipping, the ladder should be securely held in place by tying or by a worker at the foot.
- The base of a ladder should not be placed less than ¼ its length from a wall or supporting surface and not further than ⅓ its length unless securely held or tied in place.
- Step ladders shall be fully opened while being used.
- To prevent collapse of extension ladders, the minimum overlap of sections shall be:
  - 3 feet on ladders up to 38 feet.
  - 4 feet on 40-44 foot ladders and on 3-section ladders above 44 feet
  - 5 feet on ladders above 44 feet with 2- sections.
- Ladders placed near doors or in passageways should be protected against being struck by doors or traffic.
- While going up or down a ladder, always face the ladder and use both hands for climbing. Use each rung.
- Use the correct size ladder for the job. Ladders should not be climbed higher than the third rung from the top on straight or extension ladders, or the second tread from the top on ordinary step ladders.
- Footwear should be free of grease, mud or other slippery substances when climbing or descending a ladder.
- Linemen should not wear their climbers when working on ladders, except where necessary on hook ladders suspended from wood pole structures.
- Wood ladders should not be stored in areas subject to excessive heat. Ladders shall not be used in horizontal position for runways or scaffolds.
- Scaffold shall be of sound material, securely fastened, and be capable of supporting four times the combined weight of workers and materials which may be placed on them.
- Wood planks used in scaffolds should be not less than 10 inches wide and 2 inches thick (commercial sizes) and shall not extend beyond the outer supports more than 12 inches nor less than 6 inches unless they are securely fastened down.

- Guard rails and toe boards shall be installed on all scaffolds which are 10 feet or more in height, and on all scaffolds immediately adjacent to excavations, deep water, machinery, or other sources of danger.
- A bosun chair may be used where it is impractical to reach a work location by other means.
- When a boatswain's chair is hoisted from a remote location, direct communication shall be established between the worker using the hoisting equipment and the worker in the boatswain's chair, or an observer.
- When a boatswain's chair is used in an area where the worker cannot control his/her movements, two tag lines should be used.

S 15. Hand Tools

- Employees should use only tools and equipment which are in good condition, and only for the purpose for which they are designed. When proper and safe tools are not available for the work at hand, the employee shall report the fact to his/her supervisor.
- All tools should be inspected at regular intervals, kept clean and lubricated. Tools which develop defects while in use should be removed from service, tagged, and not used again until placed in good condition.
- Impact tools with mushroomed heads such as chisels, drills, hammers, and wedges should not be used until they have been reconditioned.
- Hammers, axes, shovels, and similar tools should not be used if the handles are loose, cracked or splintered.
- Defective wrenches, such as open-end and adjustable wrenches with spread jaws or pipe wrenches with dull teeth, should not be used as they are likely to slip.
- Pipe or other extensions should not be used on a wrench handle to increase the leverage unless the wrench is specifically designed for use for such extensions.
- Metal rules, metal tape lines, or tape lines containing wires shall not be used around electric conductors or equipment.
- Sharp-edged or pointed tools shall have the edge or point guarded when not in use. Files or other tools with pointed tangs should be equipped with suitable handles.

S 16. Power Tools

- When performing maintenance or inspection on power tools, remove from all power sources.
- Before installing a new grinding wheel on a grinder, it should be given a "ring" test by supporting it free and tapping lightly with a wood object. If the wheel is not defective, it will give a clear metallic tone.
- When changing a grinding wheel, make sure that the rated speed of the wheel exceeds the maximum speed of the rotor.
- Grinding wheels should be equipped with safety washers.
- When starting a grinding wheel, stand to one side out of line of flying particles in case the wheel breaks.
- Always wear a suitable face shield or safety glasses when using a grinding wheel. Where practical, wheels should also be equipped with transparent shields and wheel guards.
- Keep the tool rest close to the wheel of the grinder to prevent work being caught between the rest and the rotating wheel? Never adjust a tool rest while the wheel is in motion.
- When using pneumatic tools, be sure that all couplings are secure and proper fittings are used (not hose clamps).
- Pneumatic and electric-drive hand tools should be equipped with controls that will stop the tool

when the operator's hand is removed from the controlling valve or switch.

- Before drilling through paving, walls or floors, check to be sure you will not cut into cables, conduits, or pipes.
- When operating a drill press, never hold small work in the hands; always use a clamp or jig. Portable electric tools should meet one of the following requirements:
    - Be equipped with 3-wire cord having the ground wire permanently connected to the tool frame and a means for grounding the other end.
    - Be connected to the power supply by means of a fully insulated isolating transformer. Be of the "double insulated" type.
    - Be completely self-contained.
- Extension cords shall be maintained in a safe condition. Worn or frayed cords and broken plugs shall be promptly replaced.
- Extension cords with exposed metal sockets shall not be used.

S 17. Cleaning Fluids

- All commercial cleaning fluids present some fire or health hazard unless proper precautions are taken (refer to the SDS procedure). Only those solvents which have been approved by the Company should be used for cleaning purposes.
- Gasoline shall never be used as a cleaning or degreasing agent.
- Carbon-tetrachloride shall not be used for cleaning purposes.
- Cleaning fluids should not be used in confined areas without adequate forced ventilation.
- Flammable solvents should be handled only in approved safety containers.
- No smoking or open flames shall be allowed where flammable solvents are being used.
- Fire extinguishing equipment shall be readily available when using flammable solvents.

S 18. Welding and Cutting

- The primary hazards during welding are electric shock, burns, radiant energy, toxic fumes, fires, and explosions. Adequate precautions shall be taken to guard against all of these hazards.
- Approved welding goggles or helmets with the proper shade lens shall be worn by welders and helpers. Clear safety glasses shall be worn under welding shields to protect against flying scale when the shield is raised or when chipping slag.
- Gauntlet gloves shall be worn while welding or cutting. Outer clothes should be free of oil or grease. Clothing around the neck, wrists and ankles should be fastened at all times. Proper protective clothing shall be used.
- Ensure adequate ventilation while welding or cutting.
- Welders should review each job site before starting welding activities and advise co-workers and notify the public of hazards that may be present when the welding activities begin. The safety signs, shields or barricades should be placed where needed to protect the public from direct rays of the electric arc. The signs should also serve as a reminder for the need of proper protective equipment. The signs should include verbiage to notify all workers in the area that eye injury may occur from looking at the welding arc. In some cases, more than one sign may be required as determined by the initial review.
- Hot material should be cooled or plainly marked before leaving it unguarded.
- When welding or cutting in elevated positions, precautions should be taken to prevent hot metal from falling onto people or combustible material.

- No welding or cutting should be attempted in dusty or gaseous areas until the area has been ventilated sufficiently to eliminate all possibility of fire or explosion.
- Where it is necessary to weld in close proximity to high-voltage circuits, solid protective barriers or other means shall be provided to prevent the ionized air or metallic vapor produced by welding from causing a flashover of the circuit.
- Where flammable material cannot be removed from exposure to sparks, it should be protected by a shield of non-combustible or fire-resistant material. The proper fire extinguisher shall be kept nearby and ready for use.
- Never allow grease or oil to come in contact with any cylinder, regulator, valve, or connection of gas welding equipment. Oil or grease in the presence of oxygen may cause an explosion.
- Never use matches to light a torch or to relight a torch on hot work. Always use an approved welder's striker.
- If a flashback occurs in a torch, first shut off the oxygen and then close the acetylene valve; check torch, tip hose and gas pressure before relighting the torch.
- Do not use an electric welder until it has been properly grounded.
- Avoid unnecessary contact with electrodes or other live parts of electric welding equipment.
- When changing electrodes on an electric welder, keep them insulated from ground or other nearby metal objects.
- Extreme caution should be used to prevent an electrode from making accidental contact with ground. When passing the electrode through doors or other close clearances, and when the welding machine is not in use, the main switch should be open.
- Where welding hose or cables must cross walkways or other open spaces where employees work or travel, they should be securely hung above or under the walkways or adequately protected from damage by walkway traffic.
- Before welding, soldering or flame cutting any tank or container ensure all flammable substances have been removed or controlled i.e. with an inert gas.
- Never look at a welding arc unless your eyes are properly protected and always remain a safe distance from the arc unless your face and hands are properly shielded from arc burn.

S 19. Storage and Handling of Compressed Gases

- Cylinders containing acetylene, oxygen, hydrogen, nitrogen, carbon dioxide, propane, CNG or any manufactured compressed gas shall always be stored upright, with their caps in place, in approved safe places away from highly combustible material and well separated from radiators, furnaces and other sources of heat. Never subject them to a temperature above 125°F.
- Oxygen cylinders should be stored separately from cylinders containing acetylene or other combustible gases. Full cylinders should be separated from empty ones.
- Gas cylinders should be secured so that they cannot be knocked over.
- Empty cylinders should be plainly marked EMPTY, the valves closed, and the caps replaced to protect the valves. Empty cylinders should be returned to the manufacturer as soon as practicable.
- While moving cylinders, their caps shall be in place and precautions shall be taken to prevent their being knocked over or dropped, as this may damage the cylinder or valve and cause an explosion or fire.
- Do not crack valves on hydrogen bottles to blow out valves and connections as the expanding hydrogen may ignite.

- Extreme caution shall be used to prevent ignition of hydrogen used as a cooling medium. A mixture of hydrogen and air containing 5% to 75 % hydrogen by volume may explode if ignited.
- Smoking, welding, or open flames are prohibited in the vicinity of hydrogen cylinders in service, or immediately below generators or synchronous condensers, as explosive mixtures of hydrogen may be present.
- Before filling any generator casing with hydrogen, all air should be scavenged with carbon dioxide (CO2) or nitrogen to prevent an explosive mixture of hydrogen. CO2 or nitrogen should also be used to expel hydrogen when removing the gas from any unit.
- Guard against suffocation in air heavily impregnated with natural gas, carbon dioxide or nitrogen without sufficient oxygen.
- While releasing compressed CO2 from cylinders, always avoid direct contact with the gas as its expansion produces a refrigerating effect which may freeze any exposed portion of the body.
- Compressed gas should not be transferred from one cylinder to another except by a qualified employee using equipment approved for the purpose.

S 20. Painting

- Employees using paints, lacquers or thinners should avoid inhaling the vapors or getting paint into the mouth. Wash hands carefully before eating.
- Do not use or go near open flames while wearing clothing contaminated with paint or thinner.
- Painting rooms or any place where spray painting is being done shall be well ventilated by exhaust systems and protected against all sources of ignition.
- Smoking, welding, burning, or other open flame is prohibited where spray painting is being done.
- Approved mask or respirator and eye protection shall be worn by anyone spray painting.

S 21. Excavating

- A Competent Person shall be on site when any employee enters an excavation.
- Trenches or excavations in unstable material or any excavation over 4 feet shall be securely shored, braced or sloped to prevent cave-in.
- Any excavation over 4 feet in depth shall have an exit i.e. ladder within 25 feet of employees in excavation.
- Where shoring, bracing, or sloping is not deemed necessary, the sides of the excavation should be inspected frequently to see that no dangerous conditions have developed. Inspections should always be made after rains or freezing and thawing condition.
- Excavated material shall be kept at least two feet from the edge of the trench or excavation.
- Heavy machinery or material should not be placed near the edge of excavations as it may cause a cave-in.

S22. Fall Protection

- The purpose of this program is to prevent work-related injuries resulting from falls. The prevention of these incidents will accomplished by the use of fall prevention and fall arrest methods, the training of effected employees and aggressive enforcement by all levels of management.
- This policy applies to all company employees who may be exposed to fall hazards in the course of their daily activities. This program also applies to non-site personnel, visitors or any individual on site exposed to a fall hazard. Unless otherwise specified, fall protection is required at elevations of 4 ft. or greater for the following work activities.

- Examples of areas where employees may have to be protected include but are not limited to the following:
    - Leading edges
    - Hoist areas
    - Holes in walk surface
    - Framework and reinforcing steel
    - Ramps, runways, and other walkways
    - Excavations
    - Working over Dangerous equipment
    - Roofing work on low or steep sloped roofs
    - Precast concrete construction
    - Wall openings
    - Scaffolds
    - Aerial lifts
- In addition to responsibilities previously outlined in the Site Safety Program, the site safety coordinator or designated competent person for fall protection will be responsible for the training of all effected company employees and enforcement of the company policy). Competent persons must be able to recognize, warn and communicate with employees that may be exposed to a fall. Also, a competent person must be designated and assigned the task and be able to accomplish the following while workers are exposed:
    - Recognize fall hazards
    - Warn employees if they are unaware of a fall hazard or is acting in an unsafe manner
    - Not have another assignment that would take monitors attention from monitoring the function.
- The instructor shall be adequately trained in the fall protection system in use and shall be responsible for training all potentially exposed employees during the new employee orientation. In the event a new system is employed, additional training on this system will commence immediately for all affected employees. Training will include, at a minimum:
    - The company fall program requirements.
    - Identification and elimination of fall hazards on the job site.
    - Safe work in hazardous areas.
    - Hazards associated with working near fall hazards.
    - Selection, use, care and inspection of fall protection equipment.
- All training must be documented in the following manner:
    - The date of training.
    - The employees printed name and signature.
    - The printed name and signature of trainer.
    - Testing results (if any).
- Retraining will occur when the employer has reason to believe that any effected employee who has already been trained does not have the understanding and skill required under employee training, the employer shall retrain each such employee. Circumstances where retraining is required include:
    - Changes in the workplace were previous training is obsolete.
    - Changes in the type of fall protection systems or equipment were previous training is obsolete.

- Inadequacies in an employee's knowledge or use of fall protection system or equipment indicate that the employee has not retained the training provided.

- All field personnel will be held accountable for the enforcement and compliance with this program. Documented safety inspections repeat discrepancies, accident investigation and implementation of accident investigation recommendations will provide the criteria for effectiveness of enforcement.
- Hazard Identification and Elimination - Compliance with fall protection requirements will be a mandatory item for all documented safety inspections. Fall protection inspections will focus on the following hazards:
  - Scaffolds
  - Ladders
  - Steel Erection
  - Roofing
  - Floor holes
  - Open sided floors
  - Aerial lifts
- The hazard identification process shall begin in the pre-bid phase with review of the scope of work, blueprints and drawings. Where feasible, pre-planning will be accomplished to prevent employees from being exposed to fall hazards. The following pre-planning steps must be considered:
  - Order and install stairways with the guardrails already attached.
  - Request the designer/architect specify proper anchor points for fall arrest systems.
  - Do not cut opening in the floors or ceilings until the material is being installed, eliminating the need for hole covers. Attach all guardrails on open sided floors before employees are allowed to work on that level.
  - Install stairs, guardrails, and other fall protection equipment early in the construction phase.
  - Require subcontractors to install fall protection systems on horizontal industrial steel prior to installation.
  - Maximize on ground assembly of structure or equipment.
  - Plan for the utilization of aerial lifts for all steel erection and concrete pre-cast erection.
- Controlled access zones are not allowed for leading edge operation at company locations. The work method employed will include a horizontal lifeline behind the leading edge, designed for multiple employees, with retractable lanyards attached for employees working on the leading edge. Equipment used will not allow employee to travel into the fall zone of a leading edge.
- When no other above-mentioned methods have been implemented a safety monitoring system shall be put in place.
- Guardrail systems incorporate a top rail at 42 inches, plus or minus 3 inches above the working platform, mid-rail and toe board. On all company projects, guardrails will be constructed of 2" X 4" construction grade lumber with posts no more than 8 feet on center; ¼" or greater wire cable, flagged every 6 feet with high visibility material; or 1.5 inch nominal diameter schedule 40 pipe with posts spaced no more than 8 foot on center. All guardrails shall be capable of supporting a 200-pound force in any direction with a maximum deflection of 3 inches. These guardrails will be placed in the following areas:
  - All stair systems.
  - All open sided floors.

- Around all holes which are too large for hole covers.
- On all elevator shaft openings.
- On all excavations over six feet in elevation.
- All scaffolding with working platforms over 6 feet.

- Harness and Lanyard: Only 4-point suspension harness and shock absorbing lanyards shall be used. Lanyards shall be equipped with locking snap hooks.
- The designated competent person shall inspect equipment at time of issue and periodically throughout the project. The employee using them shall inspect for defect and condition prior to use and on return after use. Damaged or defective equipment shall be tagged and removed from the work site or destroyed and disposed of. Shock absorbing lanyards and harness that have experienced a shock load; pitting, chaffing, burn holes or chemical exposure shall be immediately destroyed and disposed to prevent accidental use.
- All harnesses shall be properly fitted and worn. Equipment users shall be trained and instructed in the proper selection, care, use and inspection of fall protection equipment.
- Caution shall be used in selection of all fall protection equipment to ensure the proper length and application. Swing distance shall be considered when selecting connection points and lanyard or tether length.
- Fall protection anchor points shall be capable of sustaining 5000 lbs.
- Specifically engineered slings and/or chokers used to provide anchor points for lanyards shall not extend the fall distance beyond 6 feet.
- Self-retracting lifelines are part of a complete fall protection system, which automatically limits the free fall distance to 2 feet or less, consists of:
  - An anchorage point capable of supporting 5000 lbs.
  - A locking type connector to mount the device to the anchorage point.
  - The self re-tracting lifeline with locking snap hook.
  - A 4 point suspension harness
  - The installation of this device shall be directly over the work area.
  - Attached to an anchor point that is capable of sustaining 5000lbs.
  - Attached by locking snap hook to the harness “D” ring in the center of the wearers back.
  - Only one individual may be attached per unit.
- Before use, the unit shall be inspected for any indication of damage, wear or malfunction including worn cable or damaged locking snap hook.
- Pull approx. four feet of cable out of the housing and allow retracting. Maintain a slight tension on the cable. The cable shall retract smoothly and completely. DO NOT ALLOW THE CABLE TO RETRACT FREELY.
- Repairs and adjustments will not be accomplished in the field. Malfunctioning units will be tagged “do not use” and removed from the site immediately. Equipment subjected to a shock load will be tagged and removed from the site immediately.
- The selection of the proper anchorage point is critical to the effectiveness of fall protection. The anchorage point shall be:
  - Capable of sustaining a load of 5000 lbs.
  - Located equal to or above the point of operation.
  - Located above the work area to minimize or eliminate “swing” in the event of fall. Anchorage points should be identified and installed prior to lifting and setting equipment in place.
- Anchorage points selected should be positioned to allow employees to immediately connect fall

protection equipment without unprotected travel from anchorage point to anchorage point.

- In the unlikely event that a fall arrest occurs on site, personnel, using an articulating man lift or ladder where feasible, will rescue employees. Alternate rescues would be through local emergency services.
- All incidents that results in injury to workers, as well as near misses, regardless of their nature shall be reported and investigated. Investigations shall be conducted by the Safety Department as soon after the incident as possible to identify the cause and means of prevention to eliminate the risk of reoccurrence.
- In the event of such incident the Fall Protection Program (and Alternative Fall Protection Plans, if in place) shall be reevaluated by Safety Department to determine if additional practices, procedures, or training are necessary to prevent similar Incidents.

S23. Confined Space Program

- The purpose of this section is to set procedures that will ensure workers safe entry into confined spaces and permit -required confined spaces to perform routine tasks associated with their employment. This procedure is designed to provide the minimum safety requirements in accordance with the Occupational Safety and Health Administration's (OSHA) Confined Space Standard, 1910.146.
- A confined space is defined as any location that has limited openings for entry and egress, is not intended for continuous employee occupancy, and is so enclosed that natural ventilation may not reduce air contaminants to levels below the threshold limit value (TLV). Examples of confined spaces include: manholes, stacks, pipes, storage tanks, trailers, tank cars, pits, sumps, hoppers, and bins. Entry into confined spaces without proper precautions could result in injury, impairment, or death due to:
    - an atmosphere that is flammable or explosive.
    - lack of sufficient oxygen to support life.
    - contact with or inhalation of toxic materials.
    - general safety or work area hazards such as steam or high-pressure materials.
- In administering this Confined Space Program, Hampton Tedder will:
    - Monitor the effectiveness of the program.
    - Provide atmospheric testing and equipment as needed.
    - Provide personal protective equipment as needed.
    - Provide training to affected employees and supervisors.
    - Provide technical assistance as needed.
    - Preview and update the program on at least an annual basis or as needed.
- The Entry Supervisor(s) and shall be qualified and authorized to approve confined space entry permits. The Entry Supervisor(s) shall be responsible for:
    - Determining if conditions are acceptable for entry.
    - Authorizing entry and overseeing entry operations.
    - Terminating entry procedures as required.
    - Serving as an Attendant, as long as the person is trained and equipped appropriately for that role.
    - Ensuring measures are in place to keep unauthorized personnel clear of the area.
    - Checking the work at least twice a shift to verify and document permit requirements are being observed (more frequent checks shall be made if operations or conditions are anticipated that could affect permit requirements).

- Ensuring that necessary information on chemical hazards is kept at the worksite for the employees or rescue team.
- Ensuring a rescue team is available and instructed in their rescue duties (i.e., an onsite team or a prearranged outside rescue service).
- Ensuring the rescue team members have current certification in first aid and cardiopulmonary resuscitation (CPR).

- In the event that we must work in a confined space alongside multiple contractors, those contractors must participate in Hampton Tedder pre-job Safety Meeting (tailboard) and cross brief each other on their specific task and associated hazards and develop a plan to coordinate around known/reasonably expected hazards.
- Attendant(s) shall be stationed outside of the confined workspace. The Attendant(s) shall:
  - Be knowledgeable of and be able to recognize potential confined space hazards.
  - Maintain a sign-in/sign-out log with a count of all persons in the confined space, and ensure all entrants sign in and out.
  - Monitor surrounding activities to ensure the safety of personnel.
  - Maintain effective and continuous communication with personnel during confined space entry, work, and exit.
  - Order personnel to evacuate the confined space if he/she:
    - Observes a condition which is not allowed on the entry permit.
    - Notices the entrants acting strangely, possibly as a result of exposure to hazardous substances.
    - Notices a situation outside the confined space which could endanger personnel.
    - Notices a hazard within the confined space that has not been previously recognized or taken into consideration.
    - Must leave his/her workstation; or
    - Must focus attention on the rescue of personnel in some other confined space that he/she is monitoring.
  - Immediately summon the Rescue Team if crew rescue becomes necessary.
  - Keep unauthorized persons out of the confined space, order them out, or notify authorized personnel of an unauthorized entry.
- It is Hampton Tedder policy that one attendant shall be only responsible for one confined space at a time.
- Rescue services must be either:
  - Provided by the host facility, or
  - Provided by an outside service which is given an opportunity to examine the entry site, practice rescue, and decline as appropriate.
  - *Rescue services must be on-site for immediately dangerous to life and health (IDLH) conditions while work is being performed.
- Employees who are granted permission to enter a confined space shall:
  - Read and observe the entry permit requirements.
  - Remain alert to the hazards that could be encountered while in the confined space.
  - Properly use the personal protective equipment that is required by the permit.
  - Immediately exit the confined space when:
    - They are ordered to do so by an authorized person.
    - They notice or recognize signs or symptoms of exposure.
    - A prohibited condition exists; or

        - the automatic alarm system sounds.
        - Alert Attendant(s) when a prohibited condition exists and/or when warning signs or symptoms of exposure exist.
- Hampton Tedder shall provide training so that all employees whose work is regulated by this Confined Space Program acquire the understanding, knowledge, and skills necessary for the safe performance of their duties in confined spaces.
- The Responsible Person shall provide training to each affected employee:
    - Before the employee is first assigned duties within a confined space.
    - Before there is a change in assigned duties.
    - When there is a change in permit space operations that presents a hazard for which an employee has not been trained; and
    - When Hampton Tedder has reason to believe that there are deviations from the confined space entry procedures required in this program, or that there are inadequacies in the employee's knowledge or use of these procedures.
- The training shall establish employee proficiency in the duties required in this program, and shall introduce new or revised procedures, as necessary, for compliance with this program.
- All employees who will enter confined spaces shall be trained in entry procedures.
- Personnel responsible for supervising, planning, entering, or participating in confined space entry and rescue shall be adequately trained in their functional duties prior to any confined space entry. Training shall include:
    - Explanation of the general hazards associated with confined spaces.
    - Discussion of specific confined space hazards associated with the facility, location, or operation.
    - Reason for, proper use, and limitations of personal protective equipment and other safety equipment required for entry into confined spaces.
    - Explanation of permits and other procedural requirements for conducting a confined space entry.
    - A clear understanding of what conditions would prohibit entry.
    - Procedures for responding to emergencies.
    - Duties and responsibilities of the confined space entry team.
    - Description of how to recognize symptoms of overexposure to probable air contaminants in themselves and co-workers, and method(s) for alerting the Attendant(s).
- Project Manager/Forman shall ensure a survey of the worksite is conducted to identify confined spaces. This survey can be partially completed from initial and continuing site characterizations, as well as other available data (i.e., blueprints and job safety analyses). The purpose of the survey is to develop an inventory of those locations and/or equipment at Hampton Tedder that meet the definition of a confined space. This information shall be communicated to personnel, and appropriate confined space procedures shall be followed prior to entry. The initial surveys shall include air monitoring to determine the air quality in the confined spaces. The potential for the following situations shall be evaluated:
    - Flammable or explosive potential.
    - Oxygen deficiency; and
    - Presence of toxic and corrosive material.
- The foreman shall identify and reevaluate hazards based on possible changes in activities or other physical or environmental conditions that could adversely affect work. A master inventory of confined spaces shall be maintained. Any change in designation of a confined space will be

routed to all affected personnel by foreman.

- A hazard assessment shall be completed by the Project Manager and Foreman prior to any entry into a confined space. The hazard assessment should identify:
    - The sequence of work to be performed in the confined space.
    - The specific hazards known or anticipated; and
    - The control measures to be implemented to eliminate or reduce each of the hazards to an acceptable level.
- No entry shall be permitted until the hazard assessment has been reviewed and discussed by all personnel engaged in the activity. Personnel who are to enter confined spaces shall be informed of known or potential hazards associated with said confined spaces.
- Hazard controls shall be instituted to address changes in the work processes and/or working environment.
- Hazard controls must be able to either control the health hazards by eliminating the responsible agents, reduce health hazards below harmful levels, or prevent the contaminants from coming into contact with the workers.
- The following order of precedence shall be followed in reducing confined space risks.
- Engineering controls are those controls that eliminate or reduce the hazard through implementation of sound engineering practices.
- Ventilation is one of the most common engineering controls used in confined spaces. When ventilation is used to remove atmospheric contaminants from a confined space, the space shall be ventilated until the atmosphere is within the acceptable ranges. Ventilation shall be maintained during the occupancy if there is a potential for the atmospheric conditions to move out of the acceptable range. When ventilation is not possible or feasible, alternate protective measures or methods to remove air contaminants and protect occupants shall be determined by Project Manager and Safety Department prior to authorizing entry.
- When conditions necessitate and can accommodate continuous forced air ventilation, the following precautions shall be followed:
    - Employees shall not enter the space until the forced air ventilation has eliminated any hazardous atmosphere.
    - Forced air ventilation shall be directed so as to ventilate the immediate areas where an employee is or will be present within the space.
    - Continuous ventilation shall be maintained until all employees have left the space.
    - Air supply or forced air ventilation shall originate from a clean source.
- If the hazard cannot be eliminated or reduced to a safe level through engineering and/or work practice controls, PPE should be used. Project Manager and Safety shall determine the appropriate PPE needed by all personnel entering the confined space, including rescue teams. PPE that meets the specifications of applicable standards shall be selected in accordance with the requirements of the job to be performed.
- The Confined Space Entry Permit is the most essential tool for assuring safety during entry in confined spaces with known hazards, or with unknown or potentially hazardous atmospheres. The entry permit process guides the supervisor and workers through a systematic evaluation of the space to be entered. The permit should be used to establish appropriate conditions. Before each entry into a confined space, an entry permit will be completed by Project Manager. The Foreman will then communicate the contents of the permit to all employees involved in the operation and post the permit conspicuously near the work location. A standard entry permit shall be used for all entries. A standard entry permit shall contain the following items:

- Space to be entered.
- Purpose of entry.
- Date and authorized duration of the entry permit.
- Name of authorized entrants within the permit space.
- Means of identifying authorized entrants inside the permit space (i.e., rosters or tracking systems).
- Name(s) of personnel serving as Attendant(s) for the permit duration.
- Name of individual serving as Entry Supervisor, with space for the signature or initials of the Entry Supervisor who originally authorized the entry.
- Hazards of the permit space to be entered.
- Measures used to isolate the permit space and to eliminate or control.
- Permit space hazards before entry (i.e., lockout/tagout of equipment and procedures for purging, ventilating, and flushing permit spaces).
- Acceptable entry conditions.
- Results of initial and periodic tests performed, accompanied by the names or initials of the testers and the date(s) when the tests were performed.
- Rescue and emergency services that can be summoned, and the means of contacting those services (i.e., equipment to use, phone numbers to call).
- Communication procedures used by authorized entrants and Attendant(s) to maintain contact during the entry.
- Equipment to be provided for compliance with this Confined Space Program (i.e., PPE, testing, communications, alarm systems, and rescue).
- Other information necessary for the circumstances of the particular confined space that will help ensure employee safety.
- Additional permits, such as for hot work, that have been issued to authorize work on the permit space.

- A permit is only valid for one shift. For a permit to be renewed, the following conditions shall be met before each reentry into the confined space:
  - Atmospheric testing shall be conducted and the results should be within acceptable limits. If atmospheric test results are not within acceptable limits, precautions to protect entrants against the hazards should be addressed on the permit and should be in place.
  - Foreman shall verify that all precautions and other measures called for on the permit are still in effect.
  - Only operations or work originally approved on the permit shall be conducted in the confined space.
- A new permit shall be issued, or the original permit will be reissued if possible, whenever changing work conditions or work activities introduce new hazards into the confined space. Foreman shall retain each canceled entry permit for at least one (1) year to facilitate the review of the Confined Space Entry Program. Any problems encountered during an entry operation shall be noted on the respective permit(s) so that appropriate revisions to the confined space permit program can be made.
- When entry into a confined space is necessary, either the Entry Supervisor or Project Manager may initiate entry procedures, including the completion of a confined space entry permit. Entry into a confined space shall follow the standard entry procedure below.
  - The entire confined space entry permit shall be completed before a standard entry. Entry shall be allowed only when all requirements of the permit are met and it is reviewed and

signed by an Entry Supervisor. The following conditions must be met prior to standard entry:
    - Affected personnel shall be trained to establish proficiency in the duties that will be performed within the confined space.
    - The internal atmosphere within the confined space shall be tested by Foreman with a calibrated, direct-reading instrument.
    - Personnel shall be provided with necessary PPE as determined by the Entry Supervisor.
- Atmospheric monitoring shall take place during the entry. If a hazardous atmosphere is detected during entry:
    - Personnel within the confined space shall be evacuated by the Attendant(s) or Entry Supervisor until the space can be evaluated by Foreman to determine how the hazardous atmosphere developed; and
    - Controls shall be put in place to protect employees before reentry.
- Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed. When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent anyone from falling through the opening. This barrier or cover shall protect each employee working in the space from foreign objects entering the space. If it is in a traffic area, adequate barriers shall be erected.
- Atmospheric test data is required prior to entry into a confined space. Atmospheric testing is required for two distinct purposes: (1) evaluation of the hazards of the permit space, and (2) verification that acceptable conditions exist for entry into that space. If a person must go into the space to obtain the needed data, then Standard Confined Space Entry Procedures shall be followed. Before entry into a confined space, Competent Person shall conduct testing for hazardous atmospheres. The internal atmosphere shall be tested with a calibrated, direct - reading instrument for oxygen, flammable gases and vapors, and potential toxic air contaminants, in that order.
- Testing equipment used in specialty areas shall be listed or approved for use in such areas by Project Manager. All testing equipment shall be approved by a nationally recognized laboratory, such as JG Tucker & Sons, Inc.
- The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity. The analysis shall identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space.
- A confined space that may contain a hazardous atmosphere shall be tested for residues of all identified or suspected contaminants. The evaluation testing should be conducted with specified equipment to determine that residual concentrations at the time or testing and entry are within acceptable limits. Results of testing shall be recorded by the person performing the tests on the permit. The atmosphere shall be periodically retested (frequency to be determined by Entry supervisor) to verify that atmospheric conditions remain within acceptable entry parameters. At any time, an employee may make the request for an atmospheric test.
- The atmosphere of the confined spaces shall be considered to be within acceptable limits when the following conditions are maintained:
    - oxygen: 19.5 percent to 23.5 percent.
    - flammability: less than 10 percent of the Lower Flammable Limit(LFL).
    - toxicity: less than recognized American Conference of Governmental Industrial Hygienists (ACGIH) exposure limits or other published exposure levels [i.e., OSHA

Permissible Exposure Limits (PELs) or National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Limit (RELs)].

- All energy sources that are potentially hazardous to confined space entrants shall be secured, relieved, disconnected, and/or restrained before personnel are permitted to enter the confined space. Equipment systems or processes shall be locked out and/or tagged out as required by the Hampton Tedder Electric Lockout/Tagout Program [which complies with OSHA's 29 CFR 1910-147 and American National Standards Institute (ANSI) Z244.1-1982, Lockout/Tagout of Energy Sources] prior to permitting entry into the confined space. In confined spaces where complete isolation is not possible, Project Manager shall evaluate the situation and make provisions for as rigorous an isolation as practical. Special precautions shall be taken when entering double - walled, jacketed, or internally insulated confined spaces that may discharge hazardous material through the vessel's internal wall.
- Where there is a need to test, position, or activate equipment by temporarily removing the lock or tag or both, a procedure shall be developed and implemented to control hazards to the occupants. Any removal of locks, tags, or other protective measures shall be done in accordance with the Hampton Tedder Lockout/Tagout protocol.
- Means for safe entry and exit shall be provided for confined spaces. Each entry and exit points shall be evaluated by Project Manager and Foreman to determine the most effective methods and equipment that will enable employees to safely enter and exit the confined space. Appropriate retrieval equipment or methods shall be used whenever a person enters a confined space. Use of retrieval equipment may be waived by the Safety Coordinator and Project Manager if use of the equipment increases the overall risks of entry or does not contribute to the rescue. A mechanical device shall be available to retrieve personnel from vertical confined spaces greater than five (5) feet in depth.
- All employees on site shall maintain a written plan of action that has provisions for conducting a timely rescue of individuals within a confined space, should an emergency arise. The written plan shall be kept onsite where the confined space work is being conducted. All affected personnel shall be trained on the Emergency Response Plan.
- Retrieval systems shall be available and ready when an authorized person enters a permit space, unless such equipment increases the overall risk of entry, or the equipment would not contribute to the rescue of the entrant. Retrieval systems shall have a chest or full-body harness and a retrieval line attached at the center of the back near shoulder level or above the head. If harnesses are not feasible, or would create a greater hazard, wristlets may be used in lieu of the harness. The retrieval line shall be firmly fastened outside the space so that rescue can begin as soon as anyone is aware that retrieval is necessary. A mechanical device shall be available to retrieve personnel from vertical confined spaces more than five (5) feet deep.

ELECTRICAL SECTION

DEFINITIONS OF TERMS USED

1 **Approved:** As used in this Safety Manual, means approval by the general manager of the operating company or his/her duly designated representative. In order to take full advantage of new developments and improved practices, it is desirable to try new equipment and new methods. The work "approved" in this Safety Manual shall not be interpreted to restrict such progress. However, caution and exercise of good judgment obviously are necessary to develop new and better practices. After such practices have been demonstrated to be useful and can be performed safely, they may be adopted when the aforementioned approval has been obtained.

2 **Barricade:** A physical obstruction, such as tapes, screens, or cones, etc., intended to warn and limit access to a hazardous area.

3 **Barrier:** A physical obstruction, which by design is intended to prevent accidental contact with exposed energized lines or equipment, or other hazards.

4 **Bonding:** The process of electrically connecting conductive objects together to bring them to the same electric potential.

5 **De-energized:** Means disconnected from all sources of electricity, but not grounded.

6 **Dead:** Means de-energized and grounded.

7 **System Operator:** Refers to the system operator, load dispatcher, substation operator, control room operator, shift engineer, or any person in charge of a line, machine, or other apparatus, regardless of his nominal title or classification.

8 **Clearance:** Notification from the System Operator to the Employee-in-Charge of performing work that all clearing procedures have been accomplished and that the employee may proceed with work on lines or equipment that were under the system operator's control.

9 **Electrical Insulation:** Any non-conducting cover that provides adequate dielectric strength to withstand the voltage between conductive objects that may be at different potentials.

10 **Foreman or Supervisor:** Refers to the person in charge of the work or working crew, regardless of his/her nominal title or classification.

11 **Grounding:** The process or method of providing an electrical connection between electric equipment and earth, or to some conductive medium that is at earth potential.

12 **Hazard:** Any unsafe act or unsafe condition that may lead to injury of persons or damage to property.

13 **Hot or live ("alive"):** Means electrically energized as distinguished from "dead" or "de-energized".

14 **Insulated Working Support:** A non-conducting support that permits workers to be in a position electrically isolated from ground.

15 **Insulator:** A non-conducting support that provides physical separation between equipment that may be at different potentials.

16 **Live Line Tool (or hot stick):** An insulating member in the form of a stick or pole having means on one or both ends for performing work while permitting the worker holding the tool to remain insulated and at a safe distance from energized equipment.

17 **Live Line Tool Method:** Performing work using tools which insulate workers from energized equipment on which work is being performed.

18 **Normal Voltage of a Circuit or System:** The rated voltage assigned for convenient designation between phase conductors of a three-phase line, or the two conductors of a single-phase line, whether or not it originates from a three-phase line and whether or not one of the conductors is

grounded. If not otherwise stated, voltages given in this Safety Manual are nominal values. The actual voltage of a circuit may be higher or lower than the nominal rating.

19 **Potential:** The degree of electrification, or relative voltage, at a point in an electric circuit with respect to some other point, usually with respect to some standard such as earth.

20 **Qualified:** A person who is familiar with the construction or operation of the lines and/or equipment that concern his/her position and who is fully aware of the hazards involved. Or one who has passed a journeyman's examination for the particular branch of the electrical trade with which he/she may be connected. A person who has successfully demonstrated the ability and is recognized by management as qualified to perform the duties to which he/she has been assigned.

21 **Rubber Glove Method:** Performing work when workers wear rubber protective equipment as complete insulation between themselves and energized equipment on which work is being performed.

22 **Shall:** means mandatory.

23 **Should:** means recommended.

24 **Voltage:** The difference in electrical potential between two points in an electric circuit.

25 **Working Clearance:** The minimum distance that workers shall approach anything that is at a different potential from themselves.

OPERATIONS

E 1. General Precautions

- Before any work is undertaken on energized equipment, workers should be qualified by training and experience to perform work by the prescribed method for the voltage involved and shall be familiar with minimum working clearances stated in this section.
- Maintenance, repair and construction work on electric circuits or apparatus shall not be done until proper authorization has been obtained for performing work. A Tailboard meeting shall be conducted for all crew members prior to the start of each day discussing the following:
    - Elements of the Job.
    - Safety Hazards.
    - PPE requirements.
    - Discuss Specific Job Duties.
- All circuits and equipment shall be considered energized at full voltage until de-energized and grounded. System Operator's Clearance shall be obtained when required by rule.
- No worker shall begin work on any equipment unless instructed by his/her supervisor to do so. Where instructions must be given by telephone or radio, each speaker shall satisfy him/herself of the identity and authority of the other person.
- On all jobs, a sufficient number of qualified workers must be present to do the work safely. The number of workers required shall be determined by the foreman in charge of the work.
- Whenever it becomes necessary to replace a worker or supervisor during a job, such replacement should be made only after the replacing worker or supervisor has been fully informed of existing conditions.
- On any job which, in the opinion of the foreman, requires any observer, the foreman, or worker appointed by him, shall act as observer. The observer shall not engage in any activity that the foreman considers will interfere with the duty of an observer.
- If, when performing trouble work, a worker finds a condition which is beyond his/her ability to handle safely, he/she shall call for assistance.

- Emergency hazards, such as fallen wires, may be removed by one worker using approved tools and protective equipment.
- Before any line truck or digger truck is moved or driven, its boom or derrick shall always be placed in its stowed position. Any exception to the above rule shall be approved by the person in charge, and only if circumstances deem it necessary for the purpose of maneuvering into areas of limited space.

E 2. Care and Use of Rubber Protective Equipment

- All rubber goods shall be of high-grade material and carefully inspected, stored, and cared for.
- When not in use, rubber should be shielded from sunlight, heat, ozone, oils and any other harmful chemicals.
- When large quantities of rubber goods are carried on a truck, their use should be rotated so that all items will be used alternately.
- Rubber gloves shall not be worn wrong side out or left in that condition. Blankets shall be rolled rather that folded when not in use. Line hose and insulator hoods shall be stored in their natural position and shape.
- Rubber glove protectors shall never be worn in place of leather gloves.
- Rubber gloves shall not be used for more than 90 days beyond the date issued and have a shelf life of 180 days from test date. Tests shall conform to ASTM standards.
- The qualified Journeyman and or Apprentice shall perform an Air Roll Test of his / her rubber gloves on a daily basis or before each use.
- Rubber protective [Blankets] cover-up equipment shall not be in the field more than 180 days after date of issue. Rubber Blankets have a shelf life of 1 year.
- Rubber protective cover-up shall be visually inspected before each use.
- Rubber gloves shall be worn before coming into the close proximity or minimum approach distance to energized lines and equipment rated over 600 volts. For voltages less than 600 volts, (Ref. E3 & E14).
- Protectors furnished for use with rubber gloves shall only be use as rubber glove protectors and nothing else.
- Each worker shall make a visual of his/her rubber gloves before using them.

E 3. Working On or Near Live Lines and Equipment

- Workers performing live line work shall devote their undivided attention to the work at hand.
- Unnecessary conversation shall be avoided.
- Apprentices shall not work on or above circuits, energized at 600 volts or more, until they are at least a 4th step apprentice.
- Two qualified electrical workers shall be required to work together on the same pole or in an insulated aerial device when performing work on lines and equipment carrying voltages in excess of 600 volts. Except, one worker may support, untie or tie-in a primary distribution conductor from an insulated aerial device with a qualified observer on the ground at the job site. When working on voltages of 12,000 volts phase-to-ground and above, an additional qualified worker or supervisor may be used, if needed. In no case, when working in pairs, they shall not work simultaneously on wires or parts of different phases or polarities.
- All Aerial Equipment and other related equipment shall be grounded or barricaded when said equipment is working on or in the proximity of energized lines.
- Only fiberglass ladders and/or wood ladders may be used for working on equipment energized.

Methods of Working on Energized Equipment

- When working on energized equipment, work shall be performed with rubber protective equipment or with live line tools. Specific rules covering the above methods follow.
- With the exception of gang operated switches or breakers, before paralleling any conductors by the use of rubber gloves or hot sticks, the conductors SHALL be tested to verify proper phasing.
- Non-current carrying metal parts of equipment or devices, such as transformer cases, sectionalizing cabinets, circuit breaker housings, shall be treated as energized at the highest voltage to which they are exposed, until such time as the worker can assure that the parts are grounded.

Working with Rubber Protective Equipment

- No worker shall approach or take any conductive object close to energized parts or equipment without proper PPE. (Ref. E3 for MAD Minimum Approach Distance).
- All Lines energized at 21kV and above shall be handled with live line tools. Voltages up to 5kV may be worked with rubber gloves from the pole or an insulated aerial device or platform. Voltages from 5kV to 21kV may be worked with rubber gloves from an insulated aerial device or platform if, in the opinion of the supervisor or workers involved, the work can be done in a safe manner.
- Insulated aerial devices shall be dielectrically tested every 12 months, live line tools shall be dielectrically tested (Every 24 months) or when necessary.
- Rubber gloves, hose, hoods, and blankets shall be used to make any work performed on circuits, energized in excess of 50 volts as safe as possible. The ultimate responsibility is on the foreman, BUT the crew members are responsible at all times for safe performance of their work and proper use of the safety equipment and compliance with the safety rules and regulations.
- Class 0 (1,000 Volt) rubber gloves and cover-up shall be used when performing work on voltages up to 600 volts.
- Class II (20,000 Volt) rubber gloves and cover-up shall be used when performing work on voltages from 600 volts, up to 17kV (For Southern California Edison)
- Class III (30,000 Volts) will be used for PG&E Voltages up to 21kV.
- Approved Flame Resistant (FR) long-sleeve shirts, with sleeves rolled down and buttoned, shall be worn at all times when work is performed on or near voltages in excess of 50 volts. When jackets, coats, or coveralls are worn, they shall also be of an approved FR material. Approved long sleeve 100% cotton shirts shall be worn at all times when performing all field related work and or activities, except in those cases where work is being performed on or near voltages in excess of 50 volts. In those cases the FR shirt rule shall apply.
- All bi-pass jumpers shall always be considered non-insulated, jumper cables shall be covered when it cannot be Isolated from any type of contact.
- Tools shall be of the hotline type (hoist, slings, bolt cutters, etc.).
- A visual inspection and wiping of live line tools shall be performed before each use and associated fiberglass equipment shall be cleaned and waxed Whenever Necessary. This also includes the fiberglass or insulating portion of all derrick and aerial devises.
- Body belts, hooks or tool pouches, other than those designed for bucket work, shall not be worn in the bucket of aerial devices.
- When working on or near roadways, cones shall be placed at the traffic side of the truck, and warning signs in front and rear of truck. Local, State and Federal traffic control regulations shall

be adhered to at all times.

- A minimum of four-ounce leather gloves shall be worn when climbing poles. Leather gloves shall be worn while performing all groundwork, unless conditions require rubber gloves.
- A minimum of 100% cotton shirts, with long sleeves, shall be worn when performing groundwork.
- An OSHA approved body harness and fall arrest lanyard shall be worn at all times while working in any aerial device or on equipment where potential fall hazards exist. Personal Fall Arrest System (Section I - Mandatory; Sections II and III - Non-Mandatory) - 1910.66 App C
- All precautions for handling energized conductors shall be taken when handling insulated wires and cables. Conductor insulation shall not be relied upon for protection.
- Secondary circuits, guys, ground wires, telephone lines, and similar attachments in close proximity to the work area shall be covered with protective equipment.
- Rubber protective equipment shall be worn when climbing a pole and carrying energized equipment that is known or suspected to be defective.
- From an insulated aerial device or platform, rubber gloves and other protective equipment shall be worn when installing and removing protective equipment or barriers on all conductors or energized circuits, unless the work is performed with live line tools.
- Low voltage, Class 0 (1,000 volt), rubber gloves shall be worn at all times when coming in contact with any electrical equipment energized at voltages from 50 volts to 600 volts; i.e., installing and removing meters and performing voltage tests.

Working with Live Line Tools (All Voltages)

- MAD (Minimum Approach Distance) Minimum distances for qualified workers from exposed energized live parts. Workers shall not go into or take any conducting object, without the aid of live line tools or rubber gloves, within the distances listed below, for each normal voltage range.

Nominal Voltage Range *(phase to phase)* in Kilovolts	Minimum Approach Distance *(phase to ground)*
Above 0.6 to 15	2 feet 3 inches
Above 15 to 36	2 feet 10 inches
Above 46 to 72.5	3 feet 11 inches

- Live line tools, insulated working supports, and barriers that can absorb moisture, shall be tested for moisture before being used whenever there is any question of excessive absorption.

Working in Close Proximity to Energized Equipment

- When working within reach of lines or equipment energized from 50 volts to 21,000 volts, each worker shall wear rubber gloves or suitable barriers shall be installed to prevent accidental contact.
- When an aerial lift, derrick, or truck winch line is used in close proximity to energized equipment, all workers shall determine that the truck is clear from the energized equipment before contacting, entering, or leaving the truck. Workers who must be near the truck shall use rubber gloves in addition to other required protective equipment. All unnecessary persons on the ground shall stay out of reach of the truck and barricades or markers shall be placed when warranted.

- Barriers, when used, shall provide at least the following minimum clearances to energized conductors to ground for any method of working:

Nominal System kV	Phase-to Phase Inches	Phase-to-Ground Inches
15 and Below	6	4
23	9	6
34	12	8
46	16	10
69	23	14
138	44	31

- When working with rubber protective equipment or live line tools, and clearances specified in E 3.29 cannot be maintained for voltages 69kV and below, barriers providing at least the phase-to-ground clearances in E 3.34 or insulation adequate to withstand the voltage shall be provided.
- When raising or lowering poles between or in close proximity to energized equipment, all workers who may contact or come in close proximity to the pole shall use rubber protective equipment or dry hand-lines and wood handle tongs, as voltage may require, when handling the pole.
- Wire being strung, removed, or sagged close to energized equipment shall be considered energized and shall be handled with rubber protective equipment, dry hand-lines, barriers, or other necessary protective equipment, as voltage may require.
- Tagging out of energized primary conductors shall be performed by a qualified person using live line equipment (insulated link stick, etc.) and dry, clean ropes.

E 4. Working on De-energized Equipment

- Lines and equipment shall always be considered energized until tested and grounded. No work shall be done on equipment where System Operator's Clearance is required until Clearance has been obtained to proceed in accordance with existing operating procedures.
- When taking lines or equipment out of service, it shall first be de-energized by an appropriate switching device such as disconnect, interrupter, circuit breaker, or re-closer. For work on equipment isolating disconnecting switches on both sides of the equipment shall be opened. For work on lines, the line shall be disconnected from the electric circuit by a visible disconnecting means and/or any other possible sources of energy checked open, tagged, and locked, when applicable.
- Every effort shall be made to create an Equi-potential Zone for all workers in the work area.
- When grounding lines only approved grounding cables and approved clamping devices shall be used. A Single Point Grounding Cluster shall be mounted below the work area first. Approved grounding cables shall be connected to an approved ground, then to the cluster mount and lastly to the conductors. When removing grounds, the grounding cable shall be disconnected from each conductor first, the cluster next and lastly from the approved ground. Live line tools shall always be used for installing and removing ground cables.

- Line trucks, bucket trucks when in close proximity of energized lines shall observe one of the following protection methods:
    - An approved ground shall be installed from the line truck and or bucket truck to the system neutral or substation ground.
    - Approved barricading shall be installed around the entire perimeter of the line truck and or bucket truck and an approved rubber blanket shall be placed at that location to enter the rear bed of the truck. Bottom of blanket shall be protected.
- When working with equipment such as a wire tensioner, underground pullers and reel trailers, in close proximity of energized lines shall observe one of the following protection methods:
    - Overhead wire tensioner, underground pullers and trailers use an approved ground mat to be installed around the entire work area and connected to the equipment and to the system neutral or substation ground grid.
    - An approved ground mat shall be installed around the entire work area of the tensioner and connected to the equipment. Included in this method shall be the installation of approved barricading equipment.
- When equipment is to be treated as energized, approved rubber gloves shall be used for all equipment operations.
- Grounding: Only approved grounding jumper equipment shall be used. Temporary grounding jumpers shall be secured to permanently grounded objects in the following order of preference:
    - Station grounds,
    - Primary neutral conductor of a 4-wire circuit, Steel towers,
    - Anchor rods.
    - If none of the above are available, an approved, temporary ground rod shall be used.
        - Temporary grounding cable shall be flexible-stranded conductor of sufficient current carrying capacity to activate protective devices without damage to the cable, but not less than Flexible 1/0 Stranded Copper. Cables shall be equipped at both ends with approved clamps that apply firm pressure and can be applied with live line tools.
- When lines or equipment that may become energized from any source rated 50 volts or more to ground have been removed from service to perform work on them, all phases shall be grounded or the work shall be performed using Rubber Gloves or Live Line Tools and treated as though the equipment were energized. Before grounding the phases, a check or test for voltage shall be made with an approved testing devise. Grounds may be removed for equipment testing purposes but work on the equipment not associated with the test shall be stopped until the grounds are replaced.
- When replacing fuses installed on the high-voltage side of power transformers which cannot be handled with live line tools, safety grounding may be omitted between the fuse and the source of energy if an open-air switch, visible to the worker, isolates the fuse from the source of energy. Safety grounding may also be omitted between the fuse and the transformer, or on the low-voltage side of the transformer, if an open air switch (or switches) on the secondary side of the transformer, visible to the worker, isolates the fuse from possible back-feed through the transformer. Safety grounding on the primary side of the transformer is preferred to grounding on the secondary side. “Two (2) open points of isolation or Ground It”.
- Whenever possible, a ground shall be placed on all phase conductors at the work structure.
- On metal structures, conductors shall be considered as bonded together and grounded when each is separately grounded to the structure.

- On wood structures equipped with ground wires or grounded neutrals, the grounding system serves as the ground. On structures without ground wires, guy anchors where available or an approved temporary driven ground, preferably 50 feet away from any area where anyone is likely to be, may serve as the ground.
- When a conductor, neutral, or ground wire is to be opened, under conditions specified in (E4.8, E4.9 & E4.10) a jumper shall be placed across the opening.
- Disconnects and air breaks which have been opened shall be checked visually to ascertain that all blades are in full open position, and when equipped with locks, they shall be locked open and tagged. The motor circuit of motor-operated disconnects shall be opened, tagged, locked, and disabled, when applicable.
- When circuits are taken out of service, the fuses, if applicable, shall be removed from their holders and the line properly tagged. If the circuit is controlled by an automatic re-closing breaker, the mechanism shall be placed in the locked-out position; disconnecting devices, if any, opened, and the breaker control circuit opened and tagged.
- Grounds under the control of the System Operator shall be removed only under his/her instructions and before the apparatus is returned to service.
- All tools, temporary grounds and other equipment used on the job and all personnel shall be accounted for before releasing a Clearance.

E 5. Handling Poles

- When unloading or loading poles, workers should work at both ends of the poles whenever possible.
- Poles loaded on trailers shall be securely bound together and also to the trailer before towing. A suitable coupling device shall be securely attached to one of the poles to couple the load to the truck unless a long tongue trailer is used.
- Poles being transported along streets and or highways shall be plainly marked at the rear with red flags and an operational signal light bar at all times, day or night. State and local regulations covering the movement of loads upon streets and highways shall also be observed.
- Poles placed on piles or racks shall be securely blocked to prevent rolling or shifting.
- For raising, lowering, or pulling poles, a truck and wench should be used whenever possible. When starting to pull a pole, a pole jack shall be used initially, where necessary, to prevent over stressing the truck and winch. At no time shall the truck's boom, extension, or winch line be used for the sole purpose of pulling poles.
- When piking poles, extreme caution shall be used to keep the pole under control at all times, and orders or signals shall be given by only one worker.
- When setting or removing poles in energized lines, care shall be taken to keep the pole from coming in contact with live conductors.

E 6. Line Work on Poles

- Testing Poles: Upon inspection, if there is any doubt of the pole's soundness, and the employee in charge determines that the pole shall be tested, the test shall be made as follows:
    - Expose butt a minimum depth of 12 inches from ground surface.
    - Using a hand drill (brace and bit) bore a 9/16-inch hole in the pole at the bottom of the excavation. This hole shall be at a 30-to-45-degree angle with the center line of the pole and shall extend to within 2 inches of the opposite side (care being taken not to break through). The hole shall be plugged with a 5/8-inch creosoted dowel.

- Before climbing poles, they shall be examined to be sure that are safe. When there is doubt, the pole shall be secured with temporary guys located so they do not interfere with public traffic, or by means of a boom truck and its pole claws.
- While guying a pole, pikes may be used if manned. Unmanned pikes alone shall not be relied upon to support a pole while a worker is on it.
- Before removing or adding wires, cables, or guys, additional pole guying or bracing shall be used where necessary to take the additional strain.
- When climbing poles, care should be exercised to set the gaffs securely in the pole and to avoid weather cracks, holes, nails, signs, grounds, or other pole attachments.
- Gaffs shall be kept sharp, in good condition, and not cut down to less than 1¼ inches (inside measurement).
- Climbers shall not be worn while setting poles or doing other groundwork or while boarding, riding, or leaving Company vehicles.
- Linemen & apprentices shall use their belts and safety straps while working on a pole.
- Wire hooks shall not be attached to linemen's belts or safety straps.
- Safety straps should not be placed above the top cross-arm when it is at the top of the pole.
- Cross-arm braces or other pole attachments should not be relied upon to support a lineman's weight.
- All light equipment and tools to be used aloft should be raised and lowered by means of handline and canvas bucket or other suitable container. Care shall be taken by employees working overhead to prevent dropping and falling of tools or material. Employees on the ground should stay clear of overhead work to prevent being struck by falling objects.
- Tools and material shall not be thrown from the ground to a lineman working aloft, nor shall linemen throw tools and material from above to the ground.
- Hand axes shall not be used on overhead work.
- When an old pole is being replaced by a new pole, linemen should work from the new pole or aerial device whenever possible. Before stripping the old pole of transferring conductors, the old pole should be lashed to the new pole or supported by a boom truck and its pole claws, or guyed.
- Workers should not be on poles that are being plumbed, canted, or tamped.
- When working along streets or highways, workers shall exercise care to keep hand-lines from blowing into the line of traffic.
- When stringing wires across streets and highways, avoid interfering with traffic or causing injury to workers or pedestrians. Warning/Danger signs and traffic cones shall be put in place at each end of the work location. Local, State and Federal traffic control regulations shall be adhered to at all times.
- A lineman working on energized lines should, whenever possible, work from below the wires.
- When working on or near energized circuits on wood poles, never stand on or touch grounded circuits such as telephone wires, messenger wires, cable sheaths, ground wires, guy wires or transformer cases. Such hazards should be covered by suitable protective equipment.
- All lines, after being placed on cross-arms or racks, shall be considered energized at full voltage unless they are positively known to be dead.
- A lineman shall not lean on or crowd through unprotected wires, and should protect against the possibility of falling into high-voltage circuits. If workers must pass through other circuits to reach a working position, such circuits shall first be covered with protective equipment.
- In handling lines on a pole, they should be raised or lowered with a dry hand-line and extreme care exercised to prevent them from coming in contact with live lines and equipment.

- Poles, towers, and other structures shall not be stepped lower than 8 feet above ground, unless they are within locked enclosures.

E 7. Transformers

- Before starting work on transformers, the possibility of back-feed, abnormal voltage, or other dangerous conditions shall be eliminated. Transformer cases shall be grounded.
- On transformers connected by hot line clamps, the clamps shall be removed before starting work.
- Hot sticks shall be used when operating cut-outs and disconnects that are made for hot stick operation. Whenever possible, fused cartridges should be installed or removed with fuse sticks or tongs.
- When transformers are to be left out of service for a long period, the line lead from the cut-out or the primary riser shall be disconnected.
- Whenever transformers are replaced, the replacement transformer shall be checked for proper voltage before restoring service. Polarity and phase rotation shall also be check as applicable.
- Only approved potential transformers, voltage detectors, or voltmeters shall be used in phasing out circuits and transformers and in testing for potential.
- On distribution transformers that are used to boost or buck voltage, and where the case is not grounded, the transformer shall be disconnected and the case grounded before starting work on the transformer.
- Workers shall make sure that the cases of instrument transformers are grounded before working on them.
- Workers shall never open a current transformer secondary when the current transformer is connected to the primary, and they shall make sure that there is a ground in the secondary circuit before restoring the current transformer to service.
- Workers shall not short circuit secondary circuits of potential transformers when the potential transformer is connected to the primary, and they shall make sure that there is a ground in the secondary circuit before restoring the potential transformer to service.

E 8. Capacitors

- All capacitors shall be treated as energized until proved otherwise. All static capacitors shall be de-energized before working on them and all terminals shall be grounded.
- Before any work is attempted on a capacitor or a bank of capacitors, the following procedures shall be observed.
    - Oil switches shall be opened (if applicable).
    - Disconnects (fused cut-out) shall be opened.
    - Primary leads shall be removed from the line.
    - Allow at least five minutes after de-energizing (opening the switches) before discharging.
    - Then apply a grounding jumper(s) to each capacitor using an approved hot stick. The grounding jumper(s) shall be left connected until all work has been completed. If capacitors are to be removed from service, shunts shall be applied before removing the grounding jumper(s).
- Before re-energizing any capacitor or capacitor bank that may be suspicious in nature, a test should be performed with an approved capacitor tester.

E 9. Voltage Regulators

- Voltage regulators shall be placed in the neutral position and the control circuit opened or on manual before they are by-passed.
- Before paralleling any circuit, regulation voltage must be matched and regulators placed in the "off" or "manual" position.

E 10. Tree Trimming, Right-of-Way Clearing, and Re-clearing

- Brush and limbs shall not be dropped outside the barricaded area on streets, highways, and sidewalks.
- If a tree is to be climbed, ladders shall be used whenever possible. When climbing trees, a worker should inspect the limbs to make sure they will hold his/her weight.
- Employees working in trees shall always use safety harness, saddle, or belt with lifeline attached in such a way that if they lose their footing, they will fall away from electric conductors or other hazards.
- Axes shall not be used aloft when trimming trees.
- All tools shall be raised and lowered by hand-lines in such a way as to avoid touching energized conductors.
- Parts of trees in contact with energized conductors shall be handled as energized conductors.
- Before cutting down a tree, all limbs shall be cut off for a sufficient height to avoid striking electric conductors. Ropes shall be used to control the direction of the fall when necessary. Felling operations, once started, shall be finished before the crew leaves.
- Permission to burn brush shall be obtained when necessary.

E 11. Patrolling Lines

- Line patrols shall be performed by qualified persons only. When patrolling from the ground, patrollers shall be alert to avoid walking into fallen wires or metal fences that may be energized.
- Patrollers should be alert and avoid stumbling hazards, poisonous plants, and snakes.

E 12. Sub Stations

- Anyone visiting any substation or communications site shall contact System Operations upon arrival and departure and state the reason for the visit. Specifically detail any work that may affect the power system. This visit and reasons for the visit shall be recorded in the System Operations and Substation Logs.
- Only qualified workers or workers accompanied by a qualified worker shall be permitted inside substations.
- Each supervisor shall provide system operators with an updated list of qualified employees that may have a need enter substations and those activities each is qualified for. (i.e., view only, loading, etc.)
- Workers shall make sure the "DANGER" signs are in place and not obscured.
- Before driving a car or truck into a station, the radio antenna shall be lowered when possible and secured in place whenever the vehicle will be driven close to energized equipment.
- Gates in station fences shall be kept closed and locked except when employees are working in the yard near the open gate. Doors to enclosures containing live equipment shall be kept closed except when work is being performed inside.

- When carrying long material in areas where there is a possibility of touching energized equipment, the material shall be held by at least two workers, one at each end, and carried in the hands and not on the shoulders.
- When working around movable switch mechanisms that may operate without warning, they shall be barricaded or the operating mechanisms made inoperative.
- Before opening or closing disconnecting switches in a station, a System Operator's Clearance shall be obtained and the proper procedure followed.
- When operating gang-operated switches, a check shall be made to see that all blades are in either a full open or full closed position. The switch shall then be locked and then tagged with an approved tagging device, if applicable.
- Work shall only be done on lightning arrestors when they are disconnected from the energized circuit and both terminals are grounded.
- Before doing any work on rotating equipment; i.e., regulators, switch mechanisms, etc., the equipment should be shut down and properly disconnected from the power source except when necessary to change commentator brushes, clean with compress air, or add oil.
- When using compressed air on energized electrical machinery, an insulating hose and muzzle shall be used. Dust-proof goggles shall always be used when cleaning with compressed air.
- Only non-metallic fish tapes shall be used near energized equipment.
- When making electrolyte for storage batteries, always pour the acid into the water. Goggles or face shields shall be worn when making electrolyte.
- Smoking and use of matches or other open flames are not permitted in battery rooms or while inspecting, filling, testing, or handling batteries.
- When testing with high-voltage test equipment, the area of the test shall be barricaded with rope, tape, or other means to warn unauthorized personnel.

E 13. Underground Systems

- Before entering a manhole/vault, the following procedures shall be observed: An air and gas test shall be performed using a certified tester.
    - Vault/manhole guarding shall be secured around the vault/manhole opening with structure Log filled out.
    - An external fan or blower shall be installed and directed into the manhole/vault for a minimum of five (5) minutes before vault/manhole entry is made and shall continue until all work in the vault/manhole has been completed.
    - Approved vault rescue equipment shall be positioned at or near the vault/manhole opening and made ready for use.
    - Before re-entry into a vault/manhole, another air and gas test shall be performed.
- When entry into a vault/manhole becomes necessary, one (1) qualified worker shall remain outside the vault/manhole within a safe sight and sound distance to render assistance in case of an emergency. Open flames and smoking are prohibited while working in or around any open vault/manhole. Exception: A torch can be used when installing heat shrink splices the propane tank Must Remain outside and tied off away from the Structure
- Approved local and state mandated traffic control devices, such as Men Working Signs, Arrow Boards, Traffic Cones, shall be installed in and around the work area, including around any and all vehicles and or equipment associated with the work being performed.
- Live cables shall never be stepped on even though they are encased in a sheath. Tools and material shall not be allowed to rest against the sheaths of live cables.

- Underground cables rated in excess of 600 volts shall not be moved, bent, or re-racked while energized without the use of an approved hot stick.
- Before any work is performed on cables carrying voltages in excess to 600 volts, such cables shall be de-energized, isolated, tested de-energized by an approved test devise and grounded at "Each Work Location".
- After completing cable work, the cable shall be tagged and identified for location by a sketch and this information promptly forwarded to the persons responsible for keeping such cable identification records.
- With the exception of gang operated underground switches or breakers, with the use of an approved hot stick, before paralleling any underground cables by the use of Load Break Elbows, the cables shall be tested to verify proper phasing first.
- Whenever an employee enters a vault or manhole by vertical means, there shall be an employee or other qualified person in attendance at the surface except when
    - There are no energized cables or equipment in the structure, and;
    - A protective device is placed around the opening; and,
    - Forced ventilation is provided.
- Whenever the cover is removed from an underground structure:
    - Adequate warning devices shall be displayed in locations conspicuous to pedestrians and vehicular traffic. These shall not be removed until permanent covers are in place.
    - Trucks, tool carts, and other equipment shall be so placed as to present the least impediment or hazard to traffic consistent with safe working area for employees. If possible, trucks or equipment shall be placed between the working area and oncoming traffic.
    - Adequate barricades or standard railings shall be used unless the opening is constantly attended.
    - Protective barriers are sufficient safeguards for walk-in type vaults and shall be used.
- Employees shall not stand on energized cable or equipment while working in BURD enclosures.
- Automated Underground switches shall be made local and non-automatic/solid before working in proximity to the switch. The switching center shall be notified whenever the status of an automated switch is changed.
- No new piece of cable or switching device shall be energized until it has been positively identified by tags or other approved marking procedures.
- No piece of equipment shall be energized until all terminals, cables, and positions have been safe ended, endbelled, or otherwise protected in a way that would prevent a short circuit, ground, or personal contact.
- Employees shall not enter a structure or enclosure where new, rebuilt, or modified high-voltage cable or equipment has been energized for the first time until the cable or equipment has been energized for a minimum of five minutes.
- The fuses in underground equipment shall not be installed or removed until de-energized (this does not apply to fuses designed to interrupt load) and then only with live line tools or after grounding by approved methods.
- Cables energized at more than 600 volts shall not be cut or spliced while energized until permission has been granted by the Supervisor in charge.
- Rubber gloves shall be worn while performing the following work on conductors energized below 7500 volts:
    - Cutting or removing metallic sheathing, semi- conductor, or shielding;

- Removing or applying insulation;
- Working on bare conductor.

- Before removing a section of metallic sheathing or semi-conductor from cables energized above 600 volts, both sides shall be bonded together with a metallic jumper.
- When working on energized underground conductors or parts of energized equipment, adequate barriers or suitable protective covering shall be provided to prevent accidental contact with other conducting surfaces, including grounds.
- Live line tools shall be used when installing or removing taps between the concentric neutral conductor and any grounding point if the neutral is in service. For the purpose of this rule, the neutral will be considered in service at all times after its initial installation.
- All work on energized loadbreak components shall be performed by the policies addressed in Rule 312 b.
- De-Energized Cables or equipment to be worked up on shall be positively identified by tags, duct location, maps or approved testing means before work is started. Work will then be performed as indicated in Rules 306 b., c., d., and/or e., as appropriate.
- Cable and equipment shall be considered energized and worked with adequate protective devices until it has been tested de-energized with an approved device for indication of voltage and grounded with approved ground devices.
- Clearances, if required, shall be obtained in accordance with established procedures. After de-energized and before proceeding with the work on all power supply cables normally energized in excess of 600 volts, all conductors shall be short-circuited and grounded according procedures.
  - Between the place where the work is being done and each possible source of supply, or
  - at the work location, or
  - as close as practicable to the source of supply.
- Cables normally energized at more than 600 volts shall be spiked or grounded at the work location.
- When cable is to be spiked, it shall be done so all employees are remote from the spiking operation, i.e., from outside, an enclosure, walk-in vault, underground structure or excavation. The foregoing procedure shall be followed to prove any normally energized cable de-energized before opening the sheath.
- All switches through which it is possible to energize the power supply cable to be worked upon shall be opened and tagged.
- Moving Underground Cable
  - All in-service cables that are to be moved shall be carefully inspected before and after moving.
  - Cables energized in excess of 600 volts shall be moved only under the direction of the supervisor in charge.
  - Cables energized in excess of 600 volts shall be moved only under the direction of the employee in charge.
- When installing or removing underground cable in proximity to exposed conductors energized above 300 volts, adequate precautions shall be taken to prevent accidental contact between the cable or metallic pulling devices and exposed energized conductors. In addition, employees handling cable, reels, and tending reel dolly shall be adequately protected.
- Ducts shall always be fished in the direction which presents the least hazard. An employee shall be stationed at each end except when the employee in charge determines that no hazard exists.
- When pulling underground cable at riser poles in proximity to exposed energized conductors in

excess of 300 volts, an approved cable pulling device, based on cable size and type, shall be used. An approved pulling nose shall be used when pulling PILC cables.

- Pull ropes, fish tapes, and cables shall not be pulled into a duct already occupied by energized conductors.
- The opening or closing of energized switches or cutouts in an underground vault, manhole, C S T enclosure, or similar structure, shall be performed remotely. If remote operation is not possible, the source shall be de-energized by means of an adjacent switch, C.B., etc. where remote switching can be accomplished.
- EXCEPTION: A switch may be considered de-energized, for the purpose of switching only, when all of the following conditions exist:
    - Each step of routine or emergency switching shall be verified by two qualified employees at the work location.
- EXCEPTION: One qualified electrical worker in a classification that normally works alone, and who is trained in "self-tailboard", may verify each step of switching and operate energized "above ground" switches such as padmount or PMH type switches, or other switches located on pads.
- Locate, identify, and mark the position to be switched.
- Check all the existing positions of the switch and compare to the circuit map, switch schematic, and cable tags to ensure that the switching order will accomplish the desired results.
- If switching on a "RAC" type switch, a blocking device or special handle must be used to ensure that the switch is operated only to the desired position.
- When switching energized underground single-phase fuses or disconnects in live front PMH type equipment, an approved protective shield shall be affixed to the grip-all stick. This also includes switching in single- phase padmounted fuse cabinets. This does not apply to equipment where the fuses or disconnects are required to be de-energized.
- Disconnect Switches, or junction boxes with exposed air break blades, shall not be operated to drop load. This rule does not apply to switches designed to interrupt load.
- Permissible Work in Livefront Padmounted Transformers High-Voltage Compartment — Both Lines Energized:
    - Operation of switch handles with live line tools.
    - Phasing between lines. Probes of phasing set to be insulated to within three inches radially of probe end.
    - Removal of protective barriers with high-voltage rubber gloves or live line tools.
    - Testing of phasing voltmeter or electrostatic voltage indicator.
- High-Voltage Compartment — One Line De-Energized
    - When work is to be performed in the high-voltage compartments with one line de-energized, the following procedure shall be followed in de-energizing and working on the de-energized line.
        - Necessary switching shall be performed to de-energize the lines (with live line tools).
        - Test de-energized line with an approved testing device.
- After this procedure has been followed for all sources of supply, a clearance may be obtained.
- Testing and grounding will normally be required at two locations.

- Application of approved ground cluster with live line tool.
    - First ground cluster terminal to be applied to accessible ground wire in high - voltage compartment.
    - Remaining ground cluster terminals should be placed between bushing terminals and pothead connections.
- After testing and application of grounds, work may be performed by hand on the de-energized conductors, provided:
    - Ground cluster terminals are between the worker and any possible source of supply.
    - Adequate protective barriers on energized side of compartment are positioned so as to prevent accidental contact by workers or material
- Deadbreak Terminations
    - Normally energized high-voltage plug-in terminations shall be removed and installed only with live line tools after being tested de-energized with an approved testing device immediately prior to the operation. Live line tools are not required when applicable sections of Rule 306 are complied with.
- Loadbreak Components
    - When operating energized loadbreak components, the automatic circuit recloser on the circuit(s) being worked shall be made nonautomatic.
    - Normally energized high - voltage load break components shall be operated only with live line tools by two qualified electrical workers.
    - In loadbreak operations, the loadbreak elbow shall be installed on an appropriate accessory component immediately after removal. The components from which the elbow was removed shall also be safe ended.
    - When it is necessary to ground a loadbreak elbow which has been removed from a source component, the elbow shall be tested de-energized with an approved testing device immediately prior to being installed on a ground component.
    - Energized loadbreak components shall not be operated from inside a walk-in vault, underground vault, or manhole.
- A thermal inspection shall be conducted prior to the removal of any capacitive test point cover. If the thermal reading exceeds the allowable temperature levels referenced in the O&M Manual, the component to be worked on shall be de-energized prior to removal of the capacitive test point cover.
- Capacitive test point covers shall be removed and installed only with live line tools or high-voltage rubber gloves.
- When testing capacitive test points with an electrostatic test device, the device shall be attached to a live line tool or be held by an employee wearing high-voltage rubber gloves.
- Wire rope shall not be used to pull cable in a duct already occupied by conductors. Wire rope may be used to raise or lower equipment in a manhole or vault only when:
    - The wire rope is rigged at least six feet from all exposed energized conductors or equipment, or the energized conductors or equipment are adequately covered or protected.
- The heating of metals, oils, and insulating compounds shall be done in such a manner as to minimize hazard to the employees working in walk – in vaults or underground structures and to vehicular or pedestrian traffic.
- Furnaces and tanks containing liquefied petroleum gas shall not be placed in walk-in vaults or underground structures.

- Gloves shall be worn by employees while heating or handling hot insulating compound and metals.
- Employees shall use equipment provided for lowering material and small tools into manholes and vaults. Approved pot hooks shall be used when lowering solder pots and compound kettle. Solder ladles shall be lowered separately.
- Before lowering hot metals, oils, or hot compounds into a manhole or vault, those working in the hole shall be warned to stand clear. The employee on the surface shall not lower material until so instructed from below.
- The automatic circuit recloser on the circuit being worked shall be made non-automatic when:
    - Splicing or patching energized high-voltage underground cable.
    - Relocating energized high-voltage underground cable or equipment.
    - Filtering or replacing oil on energized high- voltage underground equipment.
    - Operating energized loadbreak components.
    - NOTE: In addition to the above requirement s supervisors in charge may make automatic circuit reclosers non- Automatic whenever they deem it necessary for the safety of the employees performing the work.
- When employees are working inside an underground structure to make repairs immediately following a high-voltage failure, the automatic recloser of all energized circuits contained in that structure shall be made nonautomatic. For those circuits not equipped with an automatic recloser device, a no test or hot line order shall be issued.
- The following procedures shall be completed prior to performing work on capacitors of any voltage.
    - The capacitors shall be de-energized using the capacitor switch provided.
    - Visually check the capacitor switch open.
    - The source switch position to the capacitor switch shall be opened, locked, and tagged. Using live line tools, the line is determinations of the capacitor switch shall be tested de-energized and grounded.
    - After waiting a minimum of five minutes from de-energizing, the capacitors shall be tested and grounded using live line tools.
- Padmount Capacitors
    - The following procedures shall be completed prior to performing work on capacitors of any voltage:
        - The capacitors shall be de-energized using the capacitor switches provided.
        - Visually check the capacitor switches open. If any are closed, open manually with live line tools.
        - Check for elimination of current flow with clamp- on ammeter.
- The source switch position to the capacitor switches shall be opened, locked, and tagged. Using live line tools, the primary terminals to the capacitor installation shall be tested de-energized and grounded.
- After waiting a minimum of five minutes from de- energizing, the capacitor terminals shall be shorted by means of temporary jumpers and adequately bonded to the case and grounded, using live line tools.

E14. LOCKOUT/TAGOUT (LOTO)

- This procedure shall be used to prevent employee exposure to hazardous electrical energy. It establishes the minimum requirements for lockout (tagout) of electrical energy sources. It provides procedures for ensuring conductors and circuit parts are disconnected from electrical energy sources and that stored energy sources are controlled. Control includes release of the stored energy as well as the prevention of re-accumulation of energy.
- All employees shall receive training as prescribed in Section B (2) of this program. All new or transferred employees and all other persons whose work operations are or might be in the area shall be instructed in the purpose and use of this procedure. A list of these employees (or job titles of employees with responsibility) is available upon request. Where needed a separate list will be included in the procedures for a given operation where LOTO is used. All persons installing a LOTO device shall sign their names and the date on the tag. For a complex LOTO the name of the individual or person in charge will be identified in the plan along with procedures for maintaining contact with that individual. Training at minimum shall cover:
    - All employees engaged in LOTO shall receive the following training:
    - The importance of LOTO and its impact on safety
    - The purpose and procedures set forth in this program as well as any individual LOTO plans developed for a specific operation
    - Recognizing LOTO devices
    - Installing LOTO devices
    - Duty of employer in writing procedures
    - Duty of employee in executing procedures
    - Duty of person-in-charge
    - Authorized and unauthorized removal of locks/tags
    - Enforcing execution of LOTO procedures
    - Individual employee control of energy
    - Simple LOTO
    - Complex LOTO
    - Using single line and diagrammatic drawings to identify sources of energy
    - Use of tags and warning signs
    - Release of stored energy
    - Personnel accounting methods
    - Grounding needs/requirements
    - Safe use of voltage detecting instruments
    - Additional training as needed to address specific hazards associated with a given operation
- When preparing for LOTO, all disconnecting means shall be identified and located to ensure that energy is interrupted by a physical break and not de-energized by a circuit interlock. This shall be accomplished by reviewing current diagrammatic drawings or other means, tags, labels, and signs.
- Each disconnecting means shall be evaluated to determine adequacy of their interrupting ability. Based on the evaluation, it will be determined if verification of a visible open point is possible, or if other precautions are needed.
- Work activity where any personnel might be exposed to sources of electrical energy hazards will be identified. It will be determined if there are any other energy sources in the area where

employees may be exposed to other types of energy. Energy control methods will be established for all hazardous energy sources.

- A voltage detector rated for voltage to which employees may be exposed will be selected for the operation. A procedure will be established for each operation to determine that the voltage detector is operating properly.
- The possibility of induced voltages or stored electrical energy will be identified. Grounds will be applied as needed before touching conductors or circuit parts.
- The following identifies the basic steps for LOTO. In addition to these steps, it shall be determined whether a Simple or Complex LOTO can be performed. The Complex LOTO plan shall address any additional steps required. A Complex LOTO will be performed when any of the following exist:
    - Multiple energy sources (more than one)
    - Multiple crews
    - Multiple crafts
    - Multiple locations
    - Multiple employers
    - Unique disconnecting means
    - Complex or particular switching sequences
    - Continues for more than one shift, that is, new workers
- Notify employees a lockout (tagout) is going to be implemented and the reason. A qualified employee knowledgeable of hazards associated with electrical energy shall implement the lockout (tagout). He/she shall know the location of disconnecting means for all sources of electrical energy and stored energy.
- All machinery operating on the circuit shall be shut down in accordance with manufactures recommended shutdown procedure to avoid increased hazards associated with equipment stoppage.
- A qualified person shall de-energize and disconnect the electric supply and relieve all stored energy.
- All disconnecting means will be locked/ tagged out with lockout (tagout) devices, isolating devices shall be physically located and operated to ensure machinery and equipment are isolated from its energy source. (Refer to Section H for appropriate devices.)
- Where only a tag is used because equipment is incapable of being locked out, additional safety measure will be used to prevent re-energization.
- Example: Removing the positive lead.
- To determine that operation is prohibited, the person applying the LOTO shall attempt to operate the disconnecting means.
- A voltage-detecting instrument shall be used to verify isolation and de-energization of equipment to be worked on. Inspect the device and do not proceed if it is damaged. Secure an undamaged device and proceed.
- Verify proper operation of the device and test for absence of voltage. Repeat verification of device after testing for absence of voltage.
- Where needed, install grounds on the phase conductors or circuit parts, to eliminate induced voltage or stored energy. Where it has been determined that contact with other exposed energized conductors or circuit parts is possible, apply ground connecting devices rated for the available fault duty.

LOTO Complete

- The following identifies the basic steps for removing a LOTO.
    - Visually verifies work is complete.
    - Clean up and remove all tools, equipment, and unused materials.
    - Remove all grounds.
    - Notify all personnel involved that the lockout (tagout) is complete, electrical energy will be restored, and to remain clear of equipment and electrical energy.
    - Perform quality control checks.
    - Remove lockout (tagout) devices (This must be done by the person(s) who installed them.
    - Notify the owner that the equipment and/or electrical supply is ready to be returned to normal operation.
    - Return the disconnecting means to their normal condition.
- Each person shall install his/her own personal lockout (tagout) device for all simple LOTO operations where more than one person is involved.
- When the lockout (tagout) extends for more than one day, the lockout (tagout) shall be verified to be still in place at the beginning of the next day. Where the lockout (tagout) is continued on successive shifts, the lockout (tagout) is considered to be a complex lockout (tagout).
- When multiple people are working under a group LOTO there shall be a "person in charge" who has the responsibility of:
    - Maintaining a "master" lock that will only be removed when affected and authorized employees are clear.
    - Maintain a lock box containing the keys for the individual LOTO devices in use and only release keys to the individuals who applied the LOTO and only when all affected and authorized employees are clear.

MOTOR VEHICLE SECTION

M 1. General

- Fleet Services has overall responsibility for the operation of Company vehicles. For items not addressed in this manual, please contact Fleet Services directly.
- It is the responsibility of every employee who drives a Company vehicle to know and obey all state and local traffic laws covering the territory in which they operate and to be familiar with and abide by Company rules and policy relative to the operation of Company vehicles. Employees shall be personally responsible for all fines and other penalties assessed against them.
- Equipment should be kept in good operating condition and operated in a safe and courteous manner. Before operating a Company vehicle, each driver shall make sure, insofar as they can determine, that it is in proper operating condition. Any unsafe condition of the vehicle should be reported and corrected before use.
- No employee shall operate a Company car or truck upon a public thoroughfare unless they have a proper license in their possession. Supervisors shall not permit an unqualified employee, or one whose license is not valid, to drive a Company vehicle.
- Before filling the gasoline tank, the motor shall always be shut off and the hose nozzle shall be kept in contact with the gas tank to avoid static sparks. Overfilling of gasoline tanks should be avoided. Smoking and open flames shall not be permitted. Also avoid using cell phones or returning to the interior of the vehicle during the refueling process. If unavoidable, be sure to discharge any potential static electricity by touching something else metal before touching the nozzle. If a static electricity charge ignites a flash fire, do not remove the nozzle from the tank.
- Filling a portable fuel container – use only approved containers, always place the container on the ground before filling and keep the pump nozzle in contact with the container.
- Vehicles with restricted rear vision such as line trucks, vans, forklifts, etc., shall be equipped with approved backup alarms or shall have an observer in view of the driver while backing.
- Check all fluids and leaks of vehicle before driving each day.

M 2. Driving

- Company vehicles shall be operated within the legal speed limit at all times and at lower speeds where conditions warrant. A fundamental rule which all drivers must observe is that “any speed which is unsafe is unlawful”.
- Seat belts shall be properly fastened and used at all times while driving or riding in Company vehicles.
- Upon the approach of an emergency vehicle such as an ambulance, police car, or fire-fighting equipment, pull to the right side of the street or highway and stop until the emergency vehicle has passed.
- Do not follow another vehicle so closely or at speeds so fast that you cannot stop within the assured clear distance ahead. Allow a following distance of at least one car length per 10 miles per hour of car speed.
- Company vehicles driven after dark shall not be operated at a speed that prevents stopping within the distance clearly illuminated by the headlights.
- Use the low headlight beam when approaching a car from the opposite direction and when following within 500 feet of a vehicle going in the same direction.
- Do not attempt to pass another vehicle going in the same direction unless you can see far enough ahead to be sure you can pass safely. Use directional signals to warn other drivers of your intentions.

- Do not drive to the left of road center when approaching the crest of a hill, an intersection, railroad crossing, curve, or where a full view of the roadway ahead is obstructed for any other reason.
- Before crossing railroad tracks, the driver of any vehicle should reduce speed and take all precautions necessary to determine that it is safe to do so.
- Practice "defensive driving". That is, make every effort to avoid an accident even though the other party may be at fault. Do not insist on your so-called right of way.
- Pedestrians should be considered as having the right of way at all times. When driving on wet streets, be careful not to splash pedestrians.

M 3. Parking

- Use care in parking cars and trucks to avoid accidents or damage to property. Drivers shall park their vehicles only in positions permitted by state laws or local ordinances.
- Whenever possible, pull-through parking should be utilized.
- When traveling through construction sites, or public rights of way, position the vehicle to avoid all structures, vehicles, walls and posts.
- Occasionally it will be necessary to park and exit the vehicle to locate a structure or to perform a visual inspection. Walk around to get a complete picture of your surroundings.
- When possible, park away from all obstacles that you will eventually have to clear when exiting. Pull through or back in when parking, enabling you to pull forward and have a clear view when exiting.
- As a general rule, drivers should avoid parking in customers' driveways whenever possible.
- When the opportunity exists to have another employee guide you in clearing all stationary objects, use it. When backing a vehicle with a trailer, the driver should have another employee guide him/her.
- Where work requires that a truck be parked on the traveled portion of a street or highway or immediately adjacent thereto, warning signs, flashers, or flags by day and red lights or flares by night should be posted not less than 200 feet ahead of and behind the vehicle in open areas, but may be closer to the vehicle in built-up areas. Traffic hazard lights should also be used. Where traffic conditions warrant, signalpersons or police officers should also be posted. (Refer to state, local, and ICC regulations covering these conditions.)
- When it is necessary to park a vehicle with the engine running, some windows should be left open to provide adequate ventilation. Do not idle motor in a closed garage.
- When parking along a highway at night, parking or low beam lights shall be left on and traffic hazard lights or other warning devices used in accordance with directions of the State Highway Department, ICC, or other regulating authority having jurisdiction.
- When parking on a grade, place vehicle in gear or parking position, set hand brake, turn wheels to curb, or otherwise block the vehicle so it cannot accidentally roll.
- To change a tire or make other necessary repairs along highway, pull off to the side of the road as far as possible. Use traffic hazard lights where necessary.
- Leave or enter parked vehicles on the curb side whenever possible. If doors must be opened on the roadside, use extreme care to see that no other vehicles are near.
- Before starting a parked vehicle, look in front and rear to make sure that people and objects are out of the way.
- Before pulling out of a parking space into traffic lane, make sure that you have plenty of room to do so safely.

M 4. Operation of Trucks and Trailers

- Before starting a truck, it should be carefully inspected to see that material is properly loaded and secured and that all workers are safely aboard.
- Loading of vehicles should not exceed their rated capacity, and objects should not be permitted to extend beyond the sides.
- Where objects extend more than 3 feet (or less if specified by local regulations) beyond the rear of the truck, the projecting end shall be marked with a red, 12" x 12" flag by day and a red light by night.
- No one shall be permitted to ride in Company vehicles in areas that are not designed for an operator or passenger.
- No extremities to extend beyond the confines of the operating compartment.
- Workers shall not be transported while standing in the vehicle with their heads above the cab or roll bar where they may be injured by low-hanging wires or tree branches, etc.
- The driver shall not permit such a number of people in the front seat as to obstruct his/her view to front and sides or interfere with the safe operation of the vehicle.
- Trailers, while being towed, shall be adequately marked with red flags in the daytime and red lights at night. These warnings should be placed at the extreme end of the trailer load and such intervals as the length of the load warrants.
- Local, state, and federal rules on lights, markers, size, weight, and load of vehicle and other regulations that apply, must also be complied with.
- Before crossing unattended railroad tracks, the driver of any Company vehicle carrying a crew of workers should stop the vehicle, look in both directions along the track, listen through an open door or window for an approaching train, and the, if safe, proceed across the tracks in low gear. Never change gears while crossing the tracks. If the "look" and "listen" precautions are prevented by obstructions, the foreman or other member of the crew should precede the vehicle onto the railroad crossing and signal when it is safe to cross.
- Before any line truck or digger truck is moved or driven, its boom or derrick shall always be placed in its stowed position. Any exception to the above rule shall be approved by the person in charge, and only if circumstances deem it necessary for the purpose of maneuvering into areas of limited space.
- Buckets shall be operated at the lower controls before use each Day.

M 5. Procedure in Traffic Accidents

- The following are provided as guidelines concerning what to do in case of a motor vehicle accident:
    - Call for emergency services if required i.e. 911. Local law enforcement should be called to any accident scene that involves the public.
    - Do not become involved in an argument as to who was responsible for an accident, but endeavor to get all the facts in the case. Remember that accidents which may appear trivial often result in claims for personal injury or property damage.
    - Do not lose your temper; try to be courteous and helpful.
    - Do not admit responsibility or offer to make any kind of settlement. Representatives of our Company or insurance company will address.
- The following instructions should be observed in the order given, if possible, when you are involved in a traffic accident:

- STOP-Pull over to the curb or out of traffic, if possible. Never leave the scene of an accident without stopping to identify yourself.
- Set flags or flares where necessary to warn traffic.
- Try to extinguish any fires and guard against starting any.
- Do not move seriously injured persons unless necessary for their protection against further injury.
- When requested, give your name, address, Company affiliation and show your driver's license to the other party.
- Obtain the name, address, and license number of the other driver, car license number, and names of car owner and insurance company.
- Record names and addresses of witnesses and, if possible, get statements.
- Unless some law enforcement officer is present at the scene of the accident, notify police having jurisdiction (state, county or city depending upon where the accident occurs). Record name and badge number of any officer present. Obtain copies of any police reports completed at the scene.
- Sketch the location showing position of vehicles or pedestrians involved, and any special conditions such as obstructions, parked car, and skid marks. Show date, time of day, weather, road conditions, and any other information which you may consider useful.
- Notify your supervisor and submit a written report with all useful information which you possess. If the fire extinguisher or first-aid kits have been used, report this fact so that they can be refilled.

M 6. Reporting Vehicle Accidents

- In the event of any accident involving Company owned or leased vehicles, contact your supervisor and the Safety department so the applicable reports and processes are completed. Please refer to the WIIPP for further details.

M 7. Vehicle Maintenance and Repair

- Each department shall be responsible for maintaining all fire extinguishers, first-aid kits, flares, chains, and other safety equipment in automotive equipment.

M 8. Commercial Driver's License (CDL)

- On October 26, 1986, Congress passed the Commercial Motor Vehicle Safety Act of 1986. This law requires each state to meet the same minimum standards for commercial driver licensing. The standards require commercial motor vehicle drivers to get a Commercial Driver's License (CDL). You must have a CDL to operate any of the following Commercial Motor Vehicles:
  - A single vehicle with a gross vehicle weight rating (GVWR) of more than 26,000 pounds.
  - A trailer with GVWR of more than 10,001
  - A vehicle designed to transport more than 15 persons (including the driver).
  - Any size vehicle which requires hazardous materials placards.

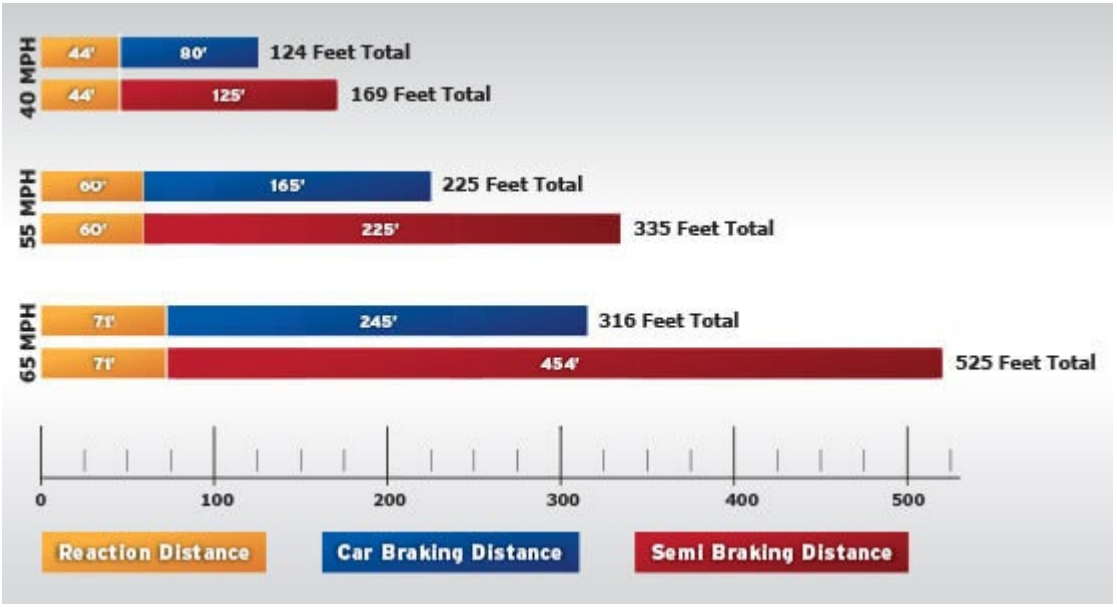
M 9. Vehicles Subject to DOT regulation

- Vehicles that are 10,000 lbs. or more are subject to the DOT Federal Motor Carrier Safety Act regulations.

M 10. Safe Stopping Distances

- The following time/distance charts shows the average distances traveled while a driver perceives a hazard and reacts to bring the vehicle to a stop:

Miles per Hour	Feet per Second	Reaction Distance	Braking Distance Dry	Braking Distance Wet	Stopping Distance Dry	Stopping Distance Wet
20	29	44	19	24	63	68
30	44	66	43	55	109	121
40	59	88	76	97	164	185
50	73	110	119	152	229	262
55	81	121	144	183	265	304
60	88	132	171	218	303	350
65	95	143	201	256	344	399
70	103	154	233	297	387	451
75	110	165	268	341	433	506



OFFICE SAFETY SECTION

O 1. Office Safety

- Each person should keep his or her workplace neat and orderly.
- Desk, cabinet and file doors should not be left open unattended. Only one file drawer should be opened at a time to prevent the file from tipping. Never rest your arm or weight on a file drawer that is open.
- Chairs and other office furniture and equipment in need of repair shall be promptly reported to the supervisor.
- All electrical cords that are frayed or broken should be removed or replaced.
- Daisy-chaining of extension cords is prohibited.
- Chairs, wastebaskets, cords, etc. shall not be left in aisles or anywhere they will constitute a tripping hazard.
- Do not place broken glass or other sharp objects in a trash container without first wrapping them in heavy paper or cardboard or placing the item in a container approved for the purpose.
- Handrails should be used when ascending or descending stairs.
- Employees shall not run up or down stairways, in hallways, or around corners.
- Paper clips, rubber bands, etc. shall not be thrown on floors, landings, or stairs. If observed, they should be picked up.
- Extra care should be used when opening or closing doors with glass panels or when the door is locked at a blind corner.
- Added caution is necessary when walking on highly polished floors or tiles, especially when they are in a damp or wet condition. Wet spots such as coffee spills, etc. should be wiped up immediately.
- Only approved ladders or step stools should be used to gain access to high shelves or files. “Roll- around” stools shall be of the weight locking type to prevent skidding or other type movement.
- Paper cutters or other type of office equipment that is equipped with a cutting edge shall have the blade in the down position, or otherwise rendered safe when it is not in use.
- Materials shall not be stacked near windows where they may fall through and injure persons or property that may be below.
- Material shall not be stored near heating equipment or ducts where it will constitute a fire hazard.
- Evacuation and emergency exit placards should be displayed in prominent areas.
- Flammable items such as cleaning fluid, alcohol, etc. shall be stored in a combustible liquids cabinet.
- All employees should report any unsafe condition that they may observe. Such conditions may be loose tiles, stair treads, loose railings, icy conditions, floor conditions, improperly operating equipment, electric hazards, improper lighting, broken or unsafe ladders, or furniture, etc. REMEMBER…SAFETY DEPENDS ON YOU!

HAZARDOUS MATERIALS SECTION

H 1. Purpose

- This policy is provided to outline those practices deemed necessary to ensure the safety and well-being of all employees who are, or may be, exposed to toxic or hazardous substances in the performance of their daily activities.

H 2. Hazardous Materials Definition

- "Hazardous Chemical" means any element, chemical compound, or mixture of elements and/or compounds which is a physical hazard or health hazard as defined by CAL-OSHA Section 5194, AB 2185, 2187, and 3377; Federal OSHA Standard in 29 CFR Section 1910.1200(c) or 1910.1200(d).

H 3. General

- Many items common to everyday life are considered toxic when improperly used, i.e., lighter fluid, sprays, medications, pesticides, paints, bleaches, etc. It is virtually impossible to list the hazardous characteristics of every compound or hazardous substance; therefore, care must be exercised in handling any toxic material. It is the responsibility of the Company to inform employees as to the potential hazards that may be present or could exist due to handling, processing, or interaction with external materials.
- All materials, substances, agents, or compounds utilized at Company locations will have Safety Data Sheets (SDS) available through the online SDS program if the item contains toxic or hazardous ingredients or is classified as toxic or as hazardous.
- SDS data shall be consistently maintained on the online SDS program and will be made available for review by the employee. Employee exposure surveys and measurements shall be conducted by qualified personnel when it is determined that employee exposures require such action. Employees, employee representatives, and other authorized persons or agencies shall have access to these records.
- It is essential that adequate ventilation, appropriate hygienic practices, effective housekeeping, protective clothing and equipment, and pertinent training for safe handling of all toxic materials be provided to diminish or eliminate any hazard that might exist.
- In all areas where a potential hazard might exist, the degree of hazard shall dictate the amount of precaution and employee protection required to provide safe working conditions.
- Where situations warrant, the designated representative or the risk management department shall make an evaluation of hazards resulting from the use of toxic material and shall recommend remedial action on an individual case basis.

H 4. Specific Practices – Mercury

- Mercury metal at room temperatures has a vapor pressure high enough to produce poisoning if a considerable area of the substance is exposed to air. Mercury should be stored in a well-ventilated area and protected from the direct rays of the sun. Containers should be kept tightly closed except when mercury is actually being transferred from them. Extreme caution shall be exercised to prevent the heating of mercury since highly toxic fumes are emitted.
- Outside air ventilation should be supplied for all indoor work rooms where mercury is handled. It is recommended that air be exhausted from indoor handling areas to ensure adequate air exchange.

- Every precaution should be taken to prevent indoor spillage of mercury. If it does occur, the floor area should be covered with water and the mercury picked up at once by vacuum or suction devices. Dry sweeping floors exposed to mercury spillage are prohibited.
- Decontamination of mercury exposed areas can be reasonably successful by using a lime/sulfur base solution. Commercial sprays, available through industrial supply vendors, should be utilized when neutralization of a contaminated area is required. Calcium polysulfide sprays are recommended and are manufactured by various companies.
- Extreme precautions shall be observed to ensure that mercury or mercury substances never come in contact with wet ammonia since a highly explosive potential will result from the mixture. It is imperative that mercury remain separate from other combinations such as nitric acid and acetylene.
- Should concentrated toxic levels of mercury vapor accidentally occur in an enclosed area, gas mask (canister type) respirators offer some protection; however, the only effective protection is a supplied air respirator which should be used in conjunction with manned lifelines for emergencies or rescue operations.
- No food or beverages shall be kept in the area where mercury is handled. Before anybody eats or drinks, his/her mouth should always be rinsed and his/her hands thoroughly washed after mercury handling. All tobacco products shall be kept clear of mercury areas and shall not be carried in work clothing when handling mercury or mercury exposed surfaces. Smoking, eating, or drinking near mercury is prohibited.
- Employees engaged in the handling of mercury metal shall wear protective equipment as follows:
    - Suitable eye and full-face shield protection with specific caution exercised to protect nose and mouth areas from contamination.
    - A rubber or latex bib type apron that provides upper chest area protection (applicable to table type operation, indoor, or enclosed area only).
    - Neoprene/plastic gloves of sufficient length to cover exposed wrist areas. If gloves should become contaminated on the inside, they shall be discarded immediately and the hands and wrists washed thoroughly with soap and water. Sleeve type shirts should be worn with sleeves unrolled and buttoned in order to provide forearm protection.
    - Tightly woven work clothing should be worn and clean work clothes worn at the beginning of each workday. Contaminated clothing should be removed as soon as practicable. Employees should shower with hot water and soap at the end of each work day to remove any possible skin contamination.
    - Heavily contaminated work clothing shall not be laundered in commercial or home laundries. A tightly covered plastic container shall be provided for the collection of contaminated clothing. The container should be stored in an area of low ambient temperature when possible. The burning of mercury contaminated clothing or material is prohibited. In all cases, the disposal of contaminated material must be in accordance with all federal, state, and local regulations covering air pollution and waste disposal. It is recommended that in all necessary handling operations where a high susceptibility of contamination exists, throw-away non-reusable type clothing should be considered for employee protection.
- A program of periodic examination or urine samples shall be implemented for all employees engaged in mercury handling. In the event an employee experiences a critical exposure, a medical examination shall be directed to ascertain the extent of contamination. The cause and

circumstances of the incident shall be fully investigated by the supervisor and a detailed report submitted to the risk management department within ten days of occurrence.

H 5. Specific Practices – Asbestos

- No employee shall be assigned any task involving dry asbestos where processing, handling, or utilization procedures would cause or create airborne asbestos fibers. All asbestos shall be worked in a wet state and cut or sized with scissors or shearing type tools that will preclude the generation or emission of fiber particles.
- All employees must be thoroughly indoctrinated in avoiding the use of asbestos wherever and whenever possible. When the handling of asbestos is considered necessary, all requirements as directed by OSHA, Federal Register, 1910.93A must be met.
- Employees are further cautioned to be aware of the hazardous conditions that exist where asbestos dust particles or airborne fibers may be present such as contract sites, buildings under construction, repair, or trans-duct installation is in progress. Unless approved type respirators are worn and caution exercised to prevent contamination of clothing, employees should avoid such areas of exposure.

H 6. Specific Practices – Solvents

- All employees engaged in the handling or use of any solvent shall be instructed in its use by the immediate supervisor.
- Most solvents, especially PVC (plastic) pipe solvent, are extremely toxic to exposed skin areas and can cause severe inflammation and tissue damage unless precaution and protective equipment is used.
- The following safety procedure will apply when any solvent is utilized.
- Leak-proof gloves and eye protection shall be worn.
- Caution shall be exercised to prevent contamination of bare areas, face, or clothing.
- If contact with solvent occurs accidentally, the exposed skin area shall be washed free of any solvent residue.
- All solvents shall be used with adequate ventilation, in approved areas designed for such purpose, or outdoors, in order to reduce or eliminate high levels of exposure to hazardous fumes.
- Employees shall use extreme caution to ensure that solvent vapor is not inhaled or introduced into the lungs. When Threshold Limit Values (TLV) are low, such as TLVs for carbon tetrachloride or benzene, 10 and 25 Parts per Million (PPM) respectively, they should not be used in open containers unless local exhaust ventilation is provided.
- Employees who handle or work with solvent in any enclosed area shall wear a respirator of suitable type if ventilation methods are insufficient to reduce the threshold limit values to safe levels.
- Contaminated materials, i.e., rags, paper, waste, etc., shall be deposited in an approved, fire-proof container and disposal action shall be taken in accordance with current federal, state, and local regulations.
- Employees shall not use solvent for any purpose unless specifically instructed or authorized to do so by their supervisors.
- Most solvents are highly flammable. Care shall be exercised, therefore, to ensure that all sources of ignition are eliminated prior to use. Adequate fire protection shall be readily available. Additionally, no solvent of any type shall be stored in an open container.
- Smoking is prohibited in any area where solvent is used or stored.

H 7. Specific Practices – Ammonia

- Employees engaged in the handling or use of ammonia (gaseous or liquid) shall be instructed in all procedures and informed as to hazardous aspects of exposure to toxic levels.
- Ammonia is an extremely strong irritant to the respiratory system. Adequate ventilation, therefore, is mandatory in all areas where ammonia is used.
- Gas masks with approved type canisters should be employed for concentrations that make breathing uncomfortable. If pronounced skin irritation is experienced or ammonia odor is noticed while using a canister mask, the employee should not stay in the area.
- Care must be exercised when contents of a tank or refrigeration system is released to ensure that no ignition source is present that may cause an explosion. Adequate fire protection equipment shall be readily available during handling, transferring, charging, or venting of ammonia or ammonia compounds.
- If an accidental release of ammonia gas occurs, which constitutes a major hazard; employees should vacate the immediate area and take positive steps to eliminate the gas with increased ventilation. Cross-venting the area to outside air through open doors or windows will aid in dissipating the fumes. Employees should not re-enter the area until the fumes have dissipated.

H 8. Specific Practices – Miscellaneous Compounds, Liquids, or Agents

- It can be safely assumed that most chemicals, petroleum byproducts, resins, etc., are toxic to humans when exposure is not controlled or eliminated. There are also many other properties that constitute a hazard such as fire, explosion, long-term contamination, etc. In the interest of safety, the following practices generally can be applied to those substances that employees may work with in the course of their daily activities:
    - Be thoroughly familiar with any organic or inorganic substance that you intend to use. Read the instruction label and comply with any caution or warning notice that is evident.
    - Use good housekeeping and sanitary practices in the storage, transport, or utilization of any toxic material.
    - If accidental exposure should occur that may produce harmful results, report the details to your supervisor immediately.
- When protective equipment is directed to be used, ensure that the fit or the coverage of exposed skin, face, or eye area is adequate and complies with the Company's respiratory protection guidelines.
- Be familiar with immediate first aid requirements in case of emergencies involving toxic substances.
- Always ensure that adequate ventilation exists and a means of egress to fresh air is available when you are working in an enclosed area.
- Ensure that appropriate type fire protection is readily available in case of emergency.
- It is well to note that any toxic substance deserves respect for its degree of hazard or toxicity. Careful planning in the utilization of these substances can render them safe and allow their use. It cannot be over-emphasized that all employees must adhere to the principles of safety and the specific handling instructions for all toxic or hazardous materials.

H 9. Responsibility

- Prepare and update the written Hazard Communication Program. Maintain lists of hazardous materials.
- Maintain the Safety Data Sheets (SDS) online inventory. Monitor compliance with procedure.
- Prepare Hazardous Material Information and Training Program and distribute to departments for implementation and maintain pertinent record of employee instruction.

Purchasing and Warehouse Department

- Establish/maintain lists of hazardous materials received through the warehouse.
- Acquire all Safety Data Sheets from vendors and submit for addition to online SDS inventory. Ensure that all containers are labeled in accordance with OSHA requirements and this procedure.
- Ensure that all materials are properly used.

Supervisors

- Ensure all employees are provided Hazardous Material Handling and Communication training. A record must be established for each employee when they receive training. This record must include employee name, date of training, and who instructed the employee. Supervisors will forward this record to the Employee Development department.
- Supervise employee handling of all hazardous materials, ensuring that the employee uses materials properly, exercises established precautions, and secures materials properly.
- Supervisors will be responsible for updating SDS list and making it available for reference to employees of their department.
- Supervisors shall monitor all substances that are purchased locally (not through the warehouse), identify the substance, and secure the SDS from the vendor. The supervisor will ensure the SDS is added to the online inventory.
- Supervisors will inform the human resources department of any noncompliance infractions.

Employees

- Employees are to participate fully in all Hazardous Material Handling and Communication training programs.
- Employees are to comply with the Hazardous Material Handling and Communication Procedure and take precautions as outlined in SDS when dealing with hazardous materials.
- Employees shall report to immediate supervisors any materials they use in their work that is considered to be hazardous, as defined by OSHA.

H 10. Container Labeling

- All warehouse personnel will verify that all containers received will:
    - Be clearly labeled as to the contents.
    - Note appropriate hazard warnings.
    - List the name and address of the manufacturer.
    - Notify the appropriate department supervisor of the purchase and provide the above information for inclusion in the Hazardous Material Inventory.
- No containers will be disbursed for use until the above data is logged and verified.
- All purchasing/warehouse departments will maintain a supply of labels for use in the warehouses and by other departments for labeling hazardous materials.
- See Exhibit A for OSHA requirements regarding labeling.

- After receiving supervisor approval, any employee who purchases materials for use on the job will:
    - Obtain the SDS from the vendor and ensure that containers are clearly labeled as to the contents in accordance with OSHA requirements.
    - Note appropriate hazard warnings.
    - List the name and address of the manufacturer.
    - Notify the appropriate department supervisor of the purchase and provide the above information for inclusion in the Hazardous Material Inventory.

H 11. Safety Data Sheets (SDS)

- Copies of the SDS for all hazardous chemicals to which employees may be exposed will be maintained in SOURCE
- A list of the hazardous chemicals known to be present at work sites is posted and is available to all employees.
- See Exhibit B for SDS requirements.

H 12. Employee Training and Information

- Each new employee will receive Hazardous Material Handling and Communication information which will include:
    - Chemicals and their hazards in the employee's work area. How to prevent exposure to these hazardous chemicals.
    - What the Company has done to lessen or prevent workers exposure to these chemicals. Procedures to follow if they are exposed to these chemicals.
    - How to access the SDS list.
- After receiving training, each employee will sign a form stating that he/she received a copy of the Hazardous Communication Program, as well as the appropriate safety training.
- Before any new hazardous chemical is introduced to the workplace, each employee will be given information in the same manner as during a safety class. The supervisor will be responsible for seeing that the SDS for the new chemical is posted to the Hazardous Material list and added to the 3E Online-SDS database.

H 13. Hazardous Materials Non-Routine Tasks

- It is Company policy that no employee will begin work in any non-routine hazardous material task without first receiving a safety briefing from the supervisor.

H 14. Informing Subcontractors

- It is the Company's responsibility to ensure that the appropriate department provides on-site contractors and their employees with the following information:
- Requested SDS sheets on hazardous chemicals to which they may be exposed while on the Company facility job site.
- SDS for all hazardous chemicals are available through the 3E Online-MDS program.

EXHIBIT A

OSHA LABELING OF CONTAINERS

- All shipped containers of hazardous chemicals must be labeled in accordance with the following requirements:
  - 1910.1200(f) (1) (i) - Identity of the hazardous chemicals(s).
  - 1910.1200(f) (1) (ii) - Appropriate hazard warnings.
  - 1910.1200(f) (1) (iii) - Name and address of the chemical Manufacturer, importer, or other responsible Party.
- All in-house containers of hazardous chemicals must be labeled in accordance with the following requirements:
  - 1910,1200(f)(5)(i) - Identity of the hazardous chemical(s).
  - 1910.1200(f)(5)(ii) - Appropriate hazard warnings.
  - NOTE: Portable containers into which hazardous chemicals are transferred from Labeled containers, and which are intended only for the immediate use of the Employee who performs the transfer is not required to be labeled.
- Labeling must not conflict with requirements of the Hazardous Materials Transportation Act, DOT regulations, or requirements of OSHA substance-Specific Standards.
- Labeling requirements do not apply to the following:
  - Pesticides covered by Federal Insecticide, Fungicide, and Rodenticide Act or the Environmental Protection Agency.
  - Substances covered by regulations issued by the Food and Drug Administration.
  - Alcoholic beverages covered by the Bureau of Alcohol, Tobacco and Firearms.
  - Products covered by regulations of the Consumer Product Safety Commission.

EXHIBIT B

OSHA REQUIREMENT/SAFETY DATA SHEET REQUIREMENTS

- Chemical manufacturers, importers, and distributors are required to obtain or develop a Safety Data Sheet (SDS) for each hazardous chemical they import or produce.
- Employers shall have a SDS for each hazardous chemical they use. The following 13 elements must be included on each SDS:
- 1910.1200(g)(2)(i) - (1) Identity/name and synonyms (2) Complete listing of hazardous components
  - (ii) - Physical and chemical characteristics
  - (iii) - Physical and chemical hazards
  - (iv) - Health hazards and medical conditions that may be aggravated
  - (v) - Primary routes of entry
  - (vi) - Permissible Exposure Limits (PEL), Threshold Limit Values (TLV), or Other appropriate exposure limits
  - (vii) - Carcinogen indication
  - (viii) - Precautions/safe handling
  - (ix) - Control Measures
  - (x) - Emergency/first aid procedures
  - (xi) - Date of SDS preparation
  - (xii) - Name, address, phone number of Chemical manufacturer, importer or Responsible party
- None of the above items may be omitted from a SDS. An entry must be made even if the entry is “Not Known” or “None”.

ENVIRONMENTAL

Hampton Tedder Electric Co. (HTE) shall comply with all applicable provisions of Federal, State, and local environmental regulations. Furthermore, HTE shall use reasonable efforts to implement environmental responsibility concerning its products and processes including, where applicable, pollution prevention and waste reduction programs.

EN1. Air Quality and Air Emissions

- Hampton Tedder Electric Co. shall:
  - Secure all required air permits as applicable.
  - Maintain any required logs, reports, or notifications.
  - Comply with all applicable rules and regulations of the Environmental Protection Agency, the California Air Resources Board and the appropriate local Air Quality Management or Air Pollution Control Districts.

EN2. Biological and Archaeological/Historical Sensitivities

- HTE shall maintain compliance with SCE's Directive (EHS-EP-DR-003) for an environmental evaluation of new and upgraded electrical system work involving voltages of 50 kV and greater by undertaking work only with written evidence that the project is GO-131D compliant.
- HTE shall maintain compliance with SCE's Directive (EHS-EP-DR-002) for environmental compliance during ground-disturbing activities, which include, but are not limited, to driving off established roads, grading, blading, trenching, digging, and vegetation removal, by undertaking work only with written evidence that an HTE Environmental Screening Form has been submitted to CEH&S, and with written evidence that the project has been cleared to proceed by CEH&S. The HTE shall abide by all avoidance and minimization measures contained in the written project clearance from CEH&S. If the project scope changes from that originally reviewed and cleared by CEH&S or avoidance measures create conflicts with project objectives, the Contractor shall immediately contact the Southern California Edison Representative, who will contact CEH&S, for consultation to ensure that the project activities are in compliance with environmental laws.
- HTE shall comply with SCE's avian protection program by immediately reporting any raptor (e.g., hawks, eagles, owls) mortalities at SCE substation, distribution or transmission facilities, not conducting any work activities that may potentially disturb active nests (i.e., nests with eggs or young birds) without clearance from CEH&S, and avoiding tree-trimming or other potentially disruptive maintenance or construction activities in sensitive areas (e.g., riparian habitat) during nesting season (generally February through August) without clearance from CEH&S.
- HTE shall comply with all Federal, State, and local environmental biological and archaeological/historical resource protection regulation, including but not limited to, the Federal and State Endangered Species Acts, California Environmental Quality Act, Clean Water Act, California Fish and Game Code, Migratory Bird Treaty Act, National Historic Preservation Act, and California Health & Safety Code Section 7050.5. Contractors shall commence work on Federal and State lands only with written evidence that applicable approvals and permits have been obtained from the appropriate public land manager.

EN3. Field Work Activities

- HTE employees performing fieldwork shall adhere to all applicable Federal, State, and local regulations and contractual obligations related to working in sensitive areas.
- HTE shall ensure that personnel have appropriate training to protect biologically, culturally, and historically sensitive areas.
- HTE shall obtain all applicable permits.
- HTE shall undertake ground disturbing activities (including vegetation removal or trimming or off-road driving) only with written evidence that the project has been cleared to do so.
- HTE shall abide by all avoidance and minimization measures contained in the written project clearance.

EN4. Hazardous Materials Transportation

- HTE hall transport all U. S. Department of Transportation (DOT) regulated hazardous materials in accordance with all applicable Federal, State, and local regulations.
- HTE shall maintain all required transportation permits, approvals, authorizations, logs, reports, or notifications, and provide copies to the Site Representative upon request.
- HTE shall notify the Site Representative of any DOT reportable incidents.

EN5. Storm Water Quality

- When working with hazardous materials, HTE shall make every attempt to prevent spills of any kind from entering a storm drain. For instance, use of spill containment is a best management practice to meet this goal.
- HTE shall be familiar with the requirements of any site-specific facility plan as they apply to any work being done at the facility.
- HTE shall not discharge any material into storm drains, sewers, or waterways unless specifically allowed by the Site's specific management plan.

EN6. Waste Handling, Storage, Transport, and Disposal

- HTE shall handle all wastes in accordance with Federal, State, and local regulations and contractual obligations.
- HTE shall have all wastes transported and disposed of in accordance with Federal, State and Local regulations and.
- Contractors shall coordinate all non-hazardous and hazardous waste disposals resulting from an HTE project with the Site Representative.
- HTE shall maintain any required logs, reports, or notifications, and provide copies to the Site Representative upon request.

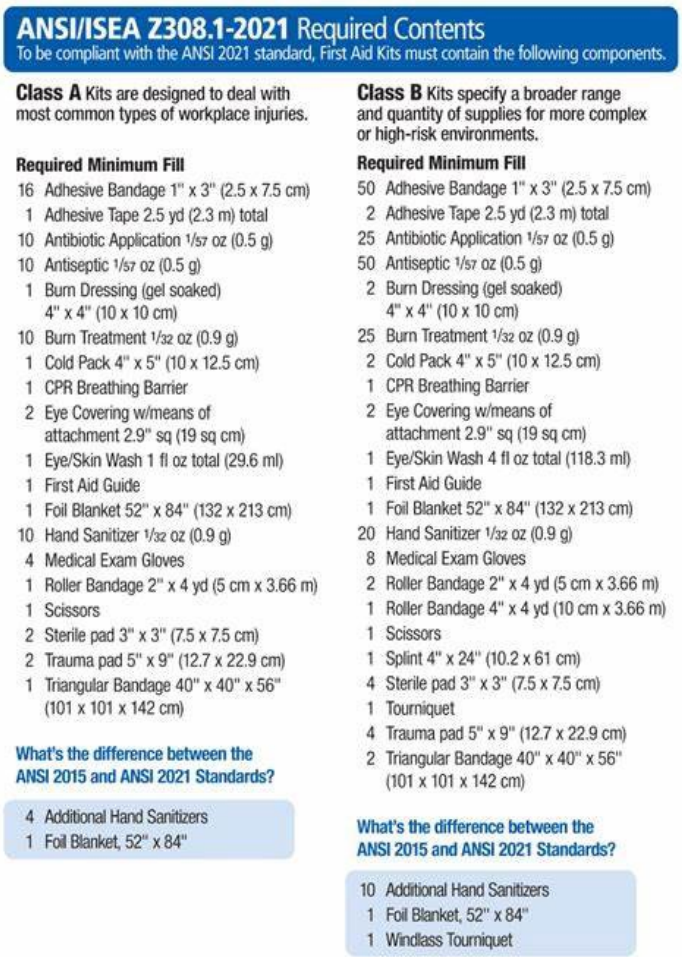
FIRST AID SECTION

F 1. General Directions

- The following section reflects the current thinking of the recognized organizations in the emergency health care field and will be subject to change by the Company as these concepts change. Most accidents are minor in nature and the first aid needed is obvious to a trained person. Employees that are trained in rendering first aid are employed throughout the company. In case of serious injury, the procedures below are usually followed:
  - Survey the scene. Enter the area only when it is safe to do so.
  - Do a primary Patient Survey. Check the ABCs – Airway, Breathing & Circulation. Request Emergency Help. Give as much information as possible.
  - Continue to administer first aid.

F 2. First Aid Kits

- Company first aid kits are available either on Company vehicles or at a fixed facility, and will be inspected once a month or restocked with required items.
- The authorized first aid kit "List of Contents" is available from ANSI Z308.1-2021.



ANSI/ISEA Z308.1-2021 Required Contents

To be compliant with the ANSI 2021 standard, First Aid Kits must contain the following components.

Class A Kits are designed to deal with most common types of workplace injuries.

Required Minimum Fill

16 Adhesive Bandage 1" x 3" (2.5 x 7.5 cm)
1 Adhesive Tape 2.5 yd (2.3 m) total
10 Antibiotic Application 1/57 oz (0.5 g)
10 Antiseptic 1/57 oz (0.5 g)
1 Burn Dressing (gel soaked) 4" x 4" (10 x 10 cm)
10 Burn Treatment 1/32 oz (0.9 g)
1 Cold Pack 4" x 5" (10 x 12.5 cm)
1 CPR Breathing Barrier
2 Eye Covering w/means of attachment 2.9" sq (19 sq cm)
1 Eye/Skin Wash 1 fl oz total (29.6 ml)
1 First Aid Guide
1 Foil Blanket 52" x 84" (132 x 213 cm)
10 Hand Sanitizer 1/32 oz (0.9 g)
4 Medical Exam Gloves
1 Roller Bandage 2" x 4 yd (5 cm x 3.66 m)
1 Scissors
2 Sterile pad 3" x 3" (7.5 x 7.5 cm)
2 Trauma pad 5" x 9" (12.7 x 22.9 cm)
1 Triangular Bandage 40" x 40" x 56" (101 x 101 x 142 cm)

What's the difference between the ANSI 2015 and ANSI 2021 Standards?

4 Additional Hand Sanitizers
1 Foil Blanket, 52" x 84"

Class B Kits specify a broader range and quantity of supplies for more complex or high-risk environments.

Required Minimum Fill

50 Adhesive Bandage 1" x 3" (2.5 x 7.5 cm)
2 Adhesive Tape 2.5 yd (2.3 m) total
25 Antibiotic Application 1/57 oz (0.5 g)
50 Antiseptic 1/57 oz (0.5 g)
2 Burn Dressing (gel soaked) 4" x 4" (10 x 10 cm)
25 Burn Treatment 1/32 oz (0.9 g)
2 Cold Pack 4" x 5" (10 x 12.5 cm)
1 CPR Breathing Barrier
2 Eye Covering w/means of attachment 2.9" sq (19 sq cm)
1 Eye/Skin Wash 4 fl oz total (118.3 ml)
1 First Aid Guide
1 Foil Blanket 52" x 84" (132 x 213 cm)
20 Hand Sanitizer 1/32 oz (0.9 g)
8 Medical Exam Gloves
2 Roller Bandage 2" x 4 yd (5 cm x 3.66 m)
1 Roller Bandage 4" x 4 yd (10 cm x 3.66 m)
1 Scissors
1 Splint 4" x 24" (10.2 x 61 cm)
4 Sterile pad 3" x 3" (7.5 x 7.5 cm)
1 Tourniquet
4 Trauma pad 5" x 9" (12.7 x 22.9 cm)
2 Triangular Bandage 40" x 40" x 56" (101 x 101 x 142 cm)

What's the difference between the ANSI 2015 and ANSI 2021 Standards?

10 Additional Hand Sanitizers
1 Foil Blanket, 52" x 84"
1 Windlass Tourniquet

F 3. Wounds and Control of Bleeding

- Remember – control bleeding by:
  - Direct pressure over the wound, if possible. Direct pressure on points to the supplying vessel.
  - If an extremity is involved, elevate it, using pillows or substitutes. Do not use a tourniquet to control bleeding.
- Shock is present in all cases of serious bleeding and should be given attention as soon as the bleeding is controlled. Stimulants should not be used under any circumstances.
- It is recommended that the patient be given warm fluids, providing he or she is conscious, and no immediate surgery is to follow.

F 4. Artificial Respiration

- Remember – if the patient is not breathing, rescue breathing (mouth to mouth) to be effective must be started within three or four minutes after the patient has ceased to breathe. Therefore, start immediately.
- Clear the mouth of foreign objects such as bum, toothpicks, dentures, partial plates, etc. If the victim is choking, use the Heimlich maneuver to clear the airway.
- Tilt the head back so the chin is pointing upward and maintain this position, thus providing a clear passage for the air as well as the control of the tongue.
- Treat for shock.
- Keep the resuscitated person quiet.
- Continue rescue breathing until the victim breathes independently or until a qualified physician takes charge. The person's chest must rise when the lungs are filled by your action. If the chest does not rise and your efforts are ineffective, you should again check to determine if obstructions are interfering.

F 5. Cardiopulmonary Resuscitation

- Important – This procedure must be started quickly when it is deemed necessary. Place victim flat on his or her back on a hard surface.
- If unconscious, open airway by using the head-tilt/chin-lift method.
- If the victim is not breathing, begin rescue breathing – Two full breaths. If the airway is blocked, perform abdominal thrusts until the airway is open.
- Check the carotid (neck) pulse. If pulse is absent, begin artificial circulation by depressing the breastbone 1½ inches to 2 inches. Make sure the heel of your hand is 2 fingers width up from the bottom of the breastbone.
- Rate of breathing/compressions.
  - One rescuer – 15 compressions to 2 breaths with 80 compressions per minute.
  - Two rescuers – 5 compressions to 1 breath with 60 compressions per minute.
- Important – Continue cardiopulmonary resuscitation until the victim breathes and circulate blood independently, until advanced life support arrives, or the victim reaches medical care.

F 6. Shock

- Remember – shock is always present – treat for it.
- Place patient in the best position as determined by his condition; lying down is preferred.
- Cover over, if necessary, according to the temperature of the environment. Insulate from the surface below if necessary.
- Fluids have value in shock. The best fluid to give a patient, if indicates, is plain water, neither hot nor cold.

F 7. Fractures

- If in doubt, treat the injury as a fracture. Keep broken ends of bone still.
- Immobilize the adjacent joints. Treat for shock.
- Provide proper transportation.
- Simple and compound fractures offer identical problems. Do not attempt to "set" bones. In a compound fracture with bleeding present, the wound is to be treated as any other wound, in addition to treating the fracture.

F 8. Dislocations

- No one except a doctor should attempt to reduce a dislocation of a major joint. Reduction of dislocations of the fingers, toes and jaw should also be done by a doctor.
- Support the dislocated member in as comfortable a position as possible. Transport to medical aid.

F 9. Sprains

- Sprains are injuries to joints. Sprains are aggravated by treatment with hot water if it is applied immediately after the injury.
- If the possibility of a fracture exists, immobilize the part as you would for a fracture. Elevate injured part.
- Apply cold applications or an ice bag during the first half hour after the injury, which may retard the swelling. Do not apply heat for at least 48 hours.

F 10. Strains

- Strains are injuries to muscles. First aid consists of rest and warm applications using wet towels. With a back strain the patient should lie on a hard surface such as the floor rather than a soft surface.

F 11. Burns

- Electrical burns – make sure the victim has been removed from the electrical source; see that he or she is breathing, and the heart has not stopped. If it has, begin cardiopulmonary resuscitation. Administer first aid for burns after the victim's breathing and heart rhythms have returned. Seek medical aid immediately.
- Chemical burns – flush affected area with large quantities of water to remove the chemicals. Administer first aid for burns. Seek medical aid immediately.
- Thermal burns – remove the victim from the immediate danger area and administer first aid for burns. Seek medical aid immediately.
- Degrees of burns.
    - First degree – skin is reddened.

- Second degree – blisters develop
- Third degree – skin is dark red, brown or black – underlying cells have been damaged.

- First aid for burns.
  - For first- and second-degree burns, immerse or cover the affected area with cool water as soon as possible and maintain treatment during transportation to medical aid.
  - For third degree burns, cover the affected area with a thick, dry sterile dressing or wrap the affected area with a thick uncontaminated cloth. The exclusion of air by the application of a thick dressing helps to relieve pain.
- Treat for shock.

F 12. Heat Stroke

- Remember – this is a serious physical condition and medical care is urgently needed. The victim may have a headache, dry skin and rapid pulse. There may be dizziness and nausea. Unconsciousness occurs in severe cases. Temperature is elevated far above normal.
- Move victim to shady area or indoors.
- Cool the victim rapidly using whatever methods you can until body temperature drops to 101°-102°F. Do not give the victim alcohol.
- Seek medical assistance ASAP.
- If emergency personnel are delayed, call hospital ER for further instructions.

F 13. Heat Illness Prevention

- Heat illness can be one or more serious medical conditions like heat cramps, fainting, heat exhaustion and heat stroke.
- Heat illness occurs when your body keeps in more heat than it loses and your temperature rises. You are at greater risk of heat illness when you:
  - Are dehydrated. Dehydration is your worst enemy during hot weather.
  - Are not used to working in the heat.
  - Are in poor health.
  - Have had heart illness before.
- Your two best defenses against the heat and heat illness are:
  - Getting out of the sun or finding a cool resting place when you are starting to overheat and need to cool down.
  - Drinking cool, fresh water throughout the day (four 8-oz cups per hour) during hot weather. That is how much your body loses by just sweating. Don't wait until you are thirsty to drink.
- Other things you can do:
  - Tell your supervisor immediately if you think you are getting sick from the heat.
  - Know the location(s) of your closest drinking water supplies.
  - Choose water over sodas and other drinks containing caffeine or sugar.
  - You are better off avoiding alcohol altogether. The more you drink, even beer, the more dehydrated you will get.
  - Always know who and how to call for help when you start a new workday.
- Know the symptoms to watch for:
  - Discomfort, excessive sweating, headache, poor concentration, muscle pain, cramping, dizziness, fatigue, irritability, loss of coordination, throwing-up, blurry vision, confusion, lack of sweating, fainting, seizures.

- If you are new to working in the heat, tell your employer. Your employer should have procedures to allow you to adjust during your first two weeks of hot weather work.
- Get your doctor's advice if you know you have risk factors for heat illness, such as:
    - Illnesses like diabetes
    - Taking medications or over-the-counter drugs
    - Being on a low salt diet
- Keep track of your coworkers. You all need to watch out for each other. If anyone looks like they are not okay. Check them out.
- After work take a cold bath or shower.
- If you are working outdoors, by law, your employer must guarantee you all of the following:
    - Access to fresh, cool drinking water throughout the day.
    - Access to shade (all employees) or an equally cool spot (if you are not an agricultural worker) for 5 minutes at a time to rest and cool down.
    - Training on how to work safely in the heat, including how to call for emergency services of someone is overcome by heat.

F 14. Animal Bites

- Remember – there is no known cure for rabies. Prevention is most important. Medical attention is recommended in all cases where the skin is broken.
- Wash the wound and surrounding area thoroughly and immediately. Apply antiseptic to wound and surrounding area.
- Animal bites to face and head are most dangerous and should receive immediate medical attention.
- All animal bites should be reported immediately to the County Animal Control Center to insure proper confinement and follow-up tests of the animal. The following information must be given to proper authorities as soon as possible.
    - Name and address of the owner. General description of the animal. Location where the injury took place. Extent of wounds.
    - Your name, address and physician.

F 15. Poisonous Snake Bites

- Keep the victim calm and as motionless as possible.
- Keep bite area below the level of the heart.
- Do not use a "Snake Bite Kit".
- Do not use a constricting tourniquet.
- Do not ice the affected part.
- Transport the victim to nearest medical facility.

F 16. Eye Injuries

- Imbedded objects must not be removed except by a physician. Bandage both eyes of the victim loosely and take him to a doctor immediately.
- If a foreign object is on the eye or eyelid, moderate efforts may be made to remove it. Use of the corner of a clean handkerchief may be appropriate.
- If a chemical substance enters the eye, immediate washing with large quantities of clean water is mandatory and should be continued for at least 15 minutes before seeking medical attention.

F 17. Emergency Transportation

- More harm is done through improper transportation than through any other measure associated with emergency assistance. Unless there is an unusual emergency, it is best to wait until an ambulance is available.

H.T.E. O.S.R.P. VAULT INSPECTION CHECKLIST

Structure #_____ Switch #_____ T.G.# _____

W.O.#_____-_____ A.I.#_-_____ Cross Sts. _____

	YES	NO	N/A	DESCRIPTION OR NOTES
1. Traffic Control	☐	☐	☐	
2. Nomex Suits	☐	☐	☐	
3. Gas/Ox Test	☐	☐	☐	
4. Ventilate Structure	☐	☐	☐	
5. Heat Scan Components	☐	☐	☐	Good Bad
6. Structure Has Water	☐	☐	☐	Depth Pump Time
7. Water Contaminated with Oil	☐	☐	☐	
8. Steam Cleaner Needed	☐	☐	☐	
9. Mud/Dirt in Structure	☐	☐	☐	Depth # of Drums
10. Asbestos in Structure	☐	☐	☐	
11. "1984" "154" 200 A. Components	☐	☐	☐	How Many
12. Cable Tags Match Circuit Map	☐	☐	☐	
13. Vault Feed Transformers	☐	☐	☐	
14. Signal/St. Lights Affected	☐	☐	☐	
15. Generator & Stop Signs Needed	☐	☐	☐	
16. Taps to be Opened at R.P.	☐	☐	☐	Accessible with B.T. Yes No
17. Visual Inspection Structure/Equip.	☐	☐	☐	
18. 3 Phase Rotation to be Taken	☐	☐	☐	

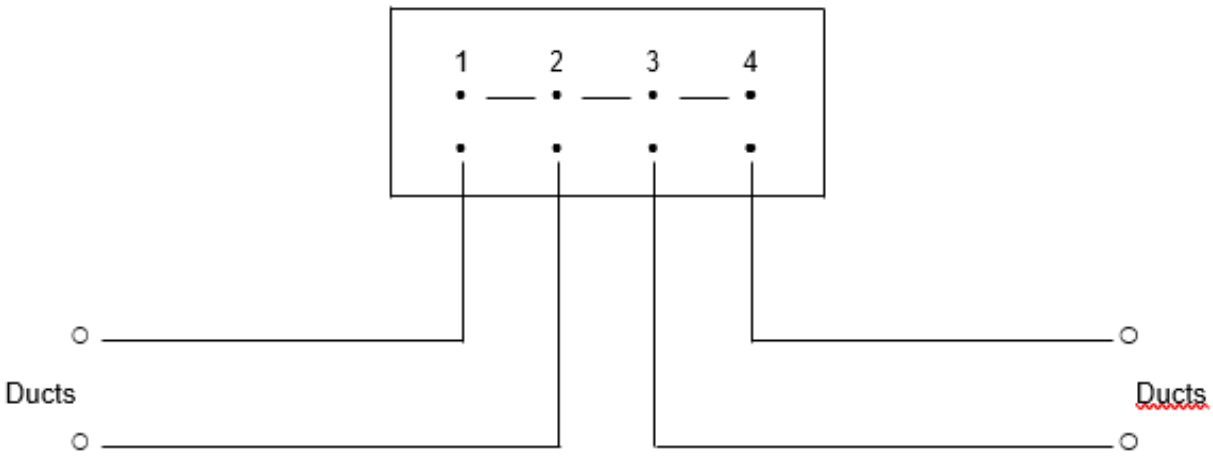
19. Clearing Switch Structures:

	Structure #	Switch #	Water	Oil/Gas Levels	Comp. Scan O.K.
1.	_____	_____	Y or N ____Ft.	O.K. or Low	Y or N
2.	_____	_____	Y or N ____Ft.	O.K. or Low	Y or N
3.	_____	_____	Y or N ____Ft.	O.K. or Low	Y or N
4.	_____	_____	Y or N ____Ft.	O.K. or Low	Y or N

Structure #_____Switch #_____T.G.#_____

W.O.#_____-_____A.I.#_-_____Cross Sts _____

20. Existing Switch Positions
- Cable Sizes & Types of Cable (PILC, CLP, EPR)
- 1/c or 3/c Cables
- Note Below & Draw In Splices or Elbows



21. Switch Position Changes:

Old	New
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____

Arizona - California - Nevada

Hampton Tedder Electric Co.

HIGH VOLTAGE CONSTRUCTION, MAINTENANCE, TESTING & ENGINEERING

Entry Permit for Restricted Area / Hazardous Atmosphere Report

Date:	
Site location or description:	
Purpose of entry:	
Supervisor(s) in charge of crews:	EMERGENCY CONTACT PHONE #:
Permit duration:	
Communication procedures (including equipment):	
Rescue procedures (also see emergency contact phone numbers above):	

REQUIREMENTS COMPLETED (Put N/A if item doesn't apply)	**DATE**	**TIME**	**REQUIREMENTS COMPLETED (Put N/A if item doesn't apply)**	**DATE**	**TIME**
Lockout/De-energize/Try-out			Supplied Air Respirator (N/A if alternate entry)		
Line(s) Broken-Capped-Blank			Respirator(s) (Air Purifying)		
Purge-Flush and Vent			Protective Clothing		
Ventilation			Full Body Harness		
Secure Area (Post and Flag)			Emergency Escape Retrieval Equip		
Lighting (Explosive Proof)			Lifelines		
Hotwork Permit			Standby safety personnel (N/A if alternate entry)		
Fire Extinguishers			Resuscitator—Inhalator (N/A if alternate entry)		

Add other specific information, if needed, or attach additional instructions or requirements. See the following examples in bold print.

Line(s) to be bled/blanked:			
Ventilation equipment:			
PPE clothing:			
Respirator(s):			
Fire extinguisher(s):			
Emergency retrieval equipment:			

AIR MONITORING											
Substance Monitored		**Permissible Levels**		**Monitoring Results**							
Time monitored (put time) Percent Oxygen		Record the time 19.5% to 23.5%									
LEL/LFL		Under 10%									
Toxic 1: Carbon Monoxide (CO)		____ PEL	ST EL								
Toxic 2: Hydrogen Sulfide (H2S)		____ PEL	ST EL								

REMARKS:

Air Tester Name	**ID#**	**Instrument(s) Used** (For example: oxygen meter, combustible gas indicator, etc.)	**Model # or Type**	**Serial# or Unit**
		Oxygen, CO, H2S, LEL		

ATTENDANTS AND ENTRANTS

Attendant(s) (Required for all confined space work except alternate entry)		**Confined Space Entrant(s)**	

REMARKS:

Arizona - California - Nevada

Hampton Tedder Electric Co.

HIGH VOLTAGE CONSTRUCTION. MAINTENANCE. TESTING & ENGINEERING

ENERGIZED ELECTRICAL WORK PERMIT Job/Work Order Number: _____

PART I: TO BE COMPLETED BY THE REQUESTER:

(1) Description of circuit/equipment/job location:

(2) Description of work to be done:

(3) Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage:

Start Date: _____ Expire Date: _____

_____

Requester/Title Date

PART II: TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSONS *DOING* THE WORK:

Detailed job description procedure to be used in performing the above detailed work including hazards, conditions, mechanical, environmental, space obstructions, other voltages: _

Description of the Safe Work Practices: ☐ LOTO ☐ Two Workers ☐ Safety Watch ☐ Notify affected workers ☐ Reason not to LOTO:

SHOCK RISK ASSESSMENT:

A shock risk assessment shall be conducted to identify the following:

(1) Shock hazards present:

(2) Estimate of the likelihood and severity of injury

a. Likelihood (1 = Unlikely, 5 = Highly Likely)

b. Severity of Possible Injury (1 = Minor, 5 = Possible Fatality)

(3) Are additional protective measures are required, including PPE? YES/NO

If additional protective measures are required that include the use of PPE, the following shall be determined:

(4) Identify the voltage to which personnel will be exposed:

(5) Identify the boundary requirements:

(6) Identify personal and other protective equipment required to prevent shock:

ARC FLASH RISK ASSESSMENT:

An arc flash risk assessment shall be performed to identify the following:

(1) Arc flash hazards present:

(2) Estimate of the likelihood and severity of injury:

The estimate of severity shall take into account:

a. Design of electrical equipment, overcurrent protective device and operating time:

b. Operating condition and condition of maintenance:

Based on the above equipment status and condition, estimate the likelihood and severity:

c. Likelihood (1 = Unlikely, 5 = Highly Likely)

d. Severity of Possible Injury (1 = Minor, 5 = Possible Fatality)

If additional protective measures are required, they should be selected and implemented. If the measures include the use of PPE the following shall be determined:

(3) Appropriate arc flash safety work practices:

(4) Proper PPE to be used within the arc flash boundary:

Incident Energy (cal/cm^2)		Flash Hazard (-1 to 4)		Limited Approach		Working Distance	
Shock Hazard (max V)		Flash Boundary		Restricted Approach		Glove Class, minimum	

Authorized Workers **Authorized Workers**

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

PART III: APPROVAL(S) TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED:

_____

Department Chair/Division Manager Date

_____

Electrically Knowledgeable Person Date

PART IV: WORK

Evidence of completion of Job Briefing including discussion of any job-related hazards:

Means used to restrict the access of unqualified persons from the work area:

PART V: POST WORK-FEEDBACK **(Worker Initials)**

_____	_____
_____	_____
_____	_____
_____	_____
Safety Manager/Representative	Close-out Date

ALTERNATING CURRENT TABLE:

Table 130.4(D)(a) Shock Protection Approach Boundaries to Exposed Energized Electrical Conductors or Circuit Parts for Alternating-Current Systems

(1)	(2)	(3)	(4)
Nominal System Voltage Range, Phase to Phase[a]	Limited Approach Boundary[b]		Restricted Approach Boundary[b]; Includes Inadvertent Movement Adder
	Exposed Movable Conductor[c]	Exposed Fixed Circuit Part	
Less than 50 V	Not specified	Not specified	Not specified
50 V–150 V[d]	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	Avoid contact
151 V–750 V	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	0.3 m (1 ft 0 in.)
751 V–15 kV	3.0 m (10 ft 0 in.)	1.5 m (5 ft 0 in.)	0.7 m (2 ft 2 in.)
15.1 kV–36 kV	3.0 m (10 ft 0 in.)	1.8 m (6 ft 0 in.)	0.8 m (2 ft 9 in.)
36.1 kV–46 kV	3.0 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	0.8 m (2 ft 9 in.)
46.1 kV–72.5 kV	3.0 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 6 in.)
72.6 kV–121 kV	3.3 m (10 ft 8 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 6 in.)
138 kV–145 kV	3.4 m (11 ft 0 in.)	3.0 m (10 ft 0 in.)	1.2 m (3 ft 10 in.)
161 kV–169 kV	3.6 m (11 ft 8 in.)	3.6 m (11 ft 8 in.)	1.3 m (4 ft 3 in.)
230 kV–242 kV	4.0 m (13 ft 0 in.)	4.0 m (13 ft 0 in.)	1.7 m (5 ft 8 in.)
345 kV–362 kV	4.7 m (15 ft 4 in.)	4.7 m (15 ft 4 in.)	2.8 m (9 ft 2 in.)
500 kV–550 kV	5.8 m (19 ft 0 in.)	5.8 m (19 ft 0 in.)	3.6 m (11 ft 8 in.)
765 kV–800 kV	7.2 m (23 ft 9 in.)	7.2 m (23 ft 9 in.)	4.9 m (15 ft 11 in.)

Notes:
(1) For arc flash boundary, see 130.5(A).
(2) All dimensions are distance from exposed energized electrical conductors or circuit part to employee.
[a]For single-phase systems above 250 volts, select the range that is equal to the system's maximum phase-to-ground voltage multiplied by 1.732.
[b]See definition in Article 100 and text in 130.4(D)(2) and Informative Annex C for elaboration.
[c]*Exposed movable conductors* describes a condition in which the distance between the conductor and a person is not under the control of the person. The term is normally applied to overhead line conductors supported by poles.
[d]This includes circuits where the exposure does not exceed 120 volts nominal.

ESTIMATE: LIKELIHOOD OF OCCURANCE OF AN ARC FLASH INCIDENT FOR AC & D

Table 130.5(C) Estimate of the Likelihood of Occurrence of an Arc Flash Incident for ac and dc Systems

Task	Equipment Condition	Likelihood of Occurrence*
Reading a panel meter while operating a meter switch. Performing infrared thermography and other non-contact inspections outside the restricted approach boundary. This activity does not include opening of doors or covers. Working on control circuits with exposed energized electrical conductors and circuit parts, nominal 125 volts ac or dc, or below without any other exposed energized equipment over nominal 125 volts ac or dc, including opening of hinged covers to gain access. Examination of insulated cable with no manipulation of cable. For dc systems, insertion or removal of individual cells or multi-cell units of a battery system in an open rack. For dc systems, maintenance on a single cell of a battery system or multi-cell units in an open rack.	Any	No
For ac systems, work on energized electrical conductors and circuit parts, including voltage testing. For dc systems, working on energized electrical conductors and circuit parts of series-connected battery cells, including voltage testing. Removal or installation of CBs or switches. Opening hinged door(s) or cover(s) or removal of bolted covers (to expose bare, energized electrical conductors and circuit parts). For dc systems, this includes bolted covers, such as battery terminal covers. Application of temporary protective grounding equipment, after voltage test. Working on control circuits with exposed energized electrical conductors and circuit parts, greater than 120 volts. Insertion or removal of individual starter buckets from motor control center (MCC). Insertion or removal (racking) of circuit breakers (CBs) or starters from cubicles, doors open or closed. Insertion or removal of plug-in devices into or from busways. Examination of insulated cable with manipulation of cable. Working on exposed energized electrical conductors and circuit parts of equipment directly supplied by a panelboard or motor control center. Insertion or removal of revenue meters (kW-hour, at primary voltage and current). Removal of battery conductive intercell connector covers. For dc systems, working on exposed energized electrical conductors and circuit parts of utilization equipment directly supplied by a dc source. Opening voltage transformer or control power transformer compartments. Operation of outdoor disconnect switch (hookstick operated) at 1 kV through 15 kV. Operation of outdoor disconnect switch (gang-operated, from grade) at 1 kV through 15 kV.	Any	Yes
Operation of a CB, switch, contactor, or starter. Voltage testing on individual battery cells or individual multi-cell units. Removal or installation of covers for equipment such as wireways, junction boxes, and cable trays that does not expose bare, energized electrical conductors and circuit parts. Opening a panelboard hinged door or cover to access dead front overcurrent devices. Removal of battery nonconductive intercell connector covers.	Normal	No
Maintenance and testing on individual battery cells or individual multi-cell units in an open rack Insertion or removal of individual cells or multi-cell units of a battery system in an open rack. Arc-resistant switchgear Type 1 or 2 (for clearing times of less than 0.5 sec with a prospective fault current not to exceed the arc-resistant rating of the equipment) and metal enclosed interrupter switchgear, fused or unfused of arc resistant type construction, 1 kV through 15 kV. Insertion or removal (racking) of CBs from cubicles; Insertion or removal (racking) of ground and test device; or Insertion or removal (racking) of voltage transformers on or off the bus.	Abnormal	Yes

(continues)

ESTIMATE: LIKELIHOOD OF OCCURANCE OF AN ARC FLASH INCIDENT FOR AC & DC CONTINUED:

Table 130.5(C) *Continued*

Task	Equipment Condition	Likelihood of Occurrence*
Equipment condition considered to be "normal" if all of the following circumstances apply: (1) The equipment is properly installed in accordance with the manufacturer's recommendations and applicable industry codes and standards. (2) The equipment is properly maintained in accordance with the manufacturer's recommendations and applicable industry codes and standards. (3) The equipment is used in accordance with instructions included in the listing and labeling and in accordance with manufacturer's instructions. (4) Equipment doors are closed and secured. (5) Equipment covers are in place and secured. (6) There is no evidence of impending failure such as arcing, overheating, loose or bound equipment parts, visible damage, or deterioration.		

*As defined in this standard, the two components of risk are the likelihood of occurrence of injury or damage to health and the severity of injury or damage to health that results from a hazard. Risk assessment is an overall process that involves estimating both the likelihood of occurrence and severity to determine if additional protective measures are required. The estimate of the likelihood of occurrence contained in this table does not cover every possible condition or situation, nor does it address severity of injury or damage to health. Where this table identifies "No" as an estimate of likelihood of occurrence, it means that an arc flash incident is not likely to occur. Where this table identifies "Yes" as an estimate of likelihood of occurrence, it means that additional protective measures are required to be selected and implemented according to the hierarchy of risk control identified in 110.1(H).

Informational Note No. 1: An example of a standard that provides information for arc-resistant switchgear referred to in Table 130.5(C) is IEEE C37.20.7, *Guide for Testing Metal-Enclosed Switchgear Rated Up to 38 kV for Internal Arcing Faults.*

Informational Note No. 2: Improper or inadequate maintenance can result in increased fault clearing time of the overcurrent protective device, thus increasing the incident energy. Where equipment is not properly installed or maintained, PPE selection based on incident energy analysis or the PPE category method might not provide adequate protection from arc flash hazards.

Informational Note No. 3: Both larger and smaller available fault currents could result in higher incident energy. If the available fault current increases without a decrease in the fault clearing time of the overcurrent protective device, the incident energy will increase. If the available fault current decreases, resulting in a longer fault clearing time for the overcurrent protective device, incident energy could also increase.

Informational Note No. 4: The occurrence of an arcing fault inside an enclosure produces a variety of physical phenomena very different from a bolted fault. For example, the arc energy resulting from an arc developed in the air will cause a sudden pressure increase and localized overheating. Equipment and design practices are available to minimize the energy levels and the number of procedures that could expose an employee to high levels of incident energy. Proven designs such as arc-resistant switchgear, remote racking (insertion or removal), remote opening and closing of switching devices, high-resistance grounding of low-voltage and 5000-volt (nominal) systems, current limitation, and specification of covered bus or covered conductors within equipment are available to reduce the risk associated with an arc flash incident. See Informative O for safety-related design requirements.

Informational Note No. 5: For additional direction for performing maintenance on overcurrent protective devices, see Chapter 2, Safety-Related Maintenance Requirements.

Informational Note No. 6: See IEEE 1584, *Guide for Performing Arc Flash Calculations*, for more information regarding incident energy and the arc flash boundary for three-phase systems.

ARC RATED CLOTHING AND OTHER PPE

Table 130.5(G) Selection of Arc-Rated Clothing and Other PPE When the Incident Energy Analysis Method Is Used

Incident energy exposures equal to 1.2 cal/cm² up to 12 cal/cm²
Arc-rated clothing with an arc rating equal to or greater than the estimated incident energy[a]
Long-sleeve shirt and pants or coverall or arc flash suit (SR)
Arc-rated face shield and arc-rated balaclava or arc flash suit hood (SR)[b]
Arc-rated outerwear (e.g., jacket, parka, rainwear, hard hat liner) (AN)
Heavy-duty leather gloves, arc-rated gloves, or rubber insulating gloves with leather protectors (SR)[c]
Hard hat
Safety glasses or safety goggles (SR)
Hearing protection
Leather footwear
Incident energy exposures greater than 12 cal/cm²
Arc-rated clothing with an arc rating equal to or greater than the estimated incident energy[a]
Long-sleeve shirt and pants or coverall or arc flash suit (SR)
Arc-rated arc flash suit hood
Arc-rated outerwear (e.g., jacket, parka, rainwear, hard hat liner) (AN)
Arc-rated gloves or rubber insulating gloves with leather protectors (SR)[c]
Hard hat
Safety glasses or safety goggles (SR)
Hearing protection
Leather footwear

SR: Selection of one in group is required.

AN: As needed.

[a]Arc ratings can be for a single layer, such as an arc-rated shirt and pants or a coverall, or for an arc flash suit or a multi-layer system if tested as a combination consisting of an arc-rated shirt and pants, coverall, and arc flash suit.

[b]Face shields with a wrap-around guarding to protect the face, chin, forehead, ears, and neck area are required by 130.7(C)(10)(c). Where the back of the head is inside the arc flash boundary, a balaclava or an arc flash hood shall be required for full head and neck protection.

[c]Rubber insulating gloves with leather protectors provide arc flash protection in addition to shock protection. Higher class rubber insulating gloves with leather protectors, due to their increased material thickness, provide increased arc flash protection.

PPE CATEGORIES

Table 130.7(C)(15)(a) Arc-Flash PPE Categories for Alternating Current (ac) Systems

Equipment	Arc-Flash PPE Category	Arc-Flash Boundary
Panelboards or other equipment rated 240 volts and below Parameters: Maximum of 25 kA available fault current; maximum of 0.03 sec (2 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	1	485 mm (19 in.)
Panelboards or other equipment rated greater than 240 volts and up to 600 volts Parameters: Maximum of 25 kA available fault current; maximum of 0.03 sec (2 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	2	900 mm (3 ft)
600-volt class motor control centers (MCCs) Parameters: Maximum of 65 kA available fault current; maximum of 0.03 sec (2 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	2	1.5 m (5 ft)
600-volt class motor control centers (MCCs) Parameters: Maximum of 42 kA available fault current; maximum of 0.33 sec (20 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	4	4.3 m (14 ft)
600-volt class switchgear (with power circuit breakers or fused switches) and 600-volt class switchboards Parameters: Maximum of 35 kA available fault current; maximum of up to 0.5 sec (30 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	4	6 m (20 ft)
Other 600-volt class (277 volts through 600 volts, nominal) equipment Parameters: Maximum of 65 kA available fault current; maximum of 0.03 sec (2 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	2	1.5 m (5 ft)
NEMA E2 (fused contactor) motor starters, 2.3 kV through 7.2 kV Parameters: Maximum of 35 kA available fault current; maximum of up to 0.24 sec (15 cycles) fault clearing time; minimum working distance 910 mm (36 in.)	4	12 m (40 ft)
Metal-clad switchgear, 1 kV through 15 kV Parameters: Maximum of 35 kA available fault current; maximum of up to 0.24 sec (15 cycles) fault clearing time; minimum working distance 910 mm (36 in.)	4	12 m (40 ft)
Arc-resistant switchgear 1 kV through 15 kV [for clearing times of less than 0.5 sec (30 cycles) with an available fault current not to exceed the arc-resistant rating of the equipment], and metal-enclosed interrupter switchgear, fused or unfused of arc-resistant-type construction, 1 kV through 15 kV Parameters: Maximum of 35 kA available fault current; maximum of up to 0.24 sec (15 cycles) fault clearing time; minimum working distance 910 mm (36 in.)	N/A (doors closed) 4 (doors open)	N/A (doors closed) 12 m (40 ft)
Other equipment 1 kV through 15 kV Parameters: Maximum of 35 kA available fault current; maximum of up to 0.24 sec (15 cycles) fault clearing time; minimum working distance 910 mm (36 in.)	4	12 m (40 ft)

Note: For equipment rated 600 volts and below and protected by upstream current-limiting fuses or current-limiting circuit breakers sized at 200 amperes or less, the arc flash PPE category can be reduced by one number but not below arc flash PPE category 1.

Informational Note to Table 130.7(C)(15)(a): The following are typical fault clearing times of overcurrent protective devices:

(1) 0.5 cycle fault clearing time is typical for current limiting fuses when the fault current is within the current limiting range.

(2) 1.5 cycle fault clearing time is typical for molded case circuit breakers rated less than 1000 volts with an instantaneous integral trip.

(3) 3.0 cycle fault clearing time is typical for insulated case circuit breakers rated less than 1000 volts with an instantaneous integral trip or relay operated trip.

(4) 5.0 cycle fault clearing time is typical for relay operated circuit breakers rated 1 kV to 35 kV when the relay operates in the instantaneous range (i.e., "no intentional delay").

(5) 20 cycle fault clearing time is typical for low-voltage power and insulated case circuit breakers with a short time fault clearing delay for motor inrush.

(6) 30 cycle fault clearing time is typical for low-voltage power and insulated case circuit breakers with a short time fault clearing delay without instantaneous trip.

Informational Note No. 1: See Table 1 of IEEE 1584TM, *Guide for Performing Arc Flash Hazard Calculations*, for further information regarding Notes b through d.

Informational Note No. 2: An example of a standard that provides information for arc-resistant switchgear referred to in Table 130.7(C)(15)(a) is IEEE C37.20.7, *Guide for Testing Metal-Enclosed Switchgear Rated Up to 38 kV for Internal Arcing Faults.*