CALIFORNIA SAFETY MANUAL
ACCIDENT PREVENTION RULES

Western Line Constructors Chapter, Inc.
N.E.C.A., Inc.

and

Local Union No. 47 and 1245 of International Brotherhood
of Electrical Workers AFL-CIO

Amended Oct, 2012

(Trademark)
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(Trademark)
Section 1.0
General Rules

1.01 Scope

These accident prevention rules shall be complied with by every employee of the Company under every circumstance where they are applicable. Acceptance of employment by an employee constitutes acceptance of these rules.

1.02 Education

In addition to any current: safety, accident prevention, and educational or training program, each supervisor or foreman shall make certain all employees under their jurisdiction are instructed and advised concerning the applicable rules and their application.

1.03 Knowledge

Each employee of the Employer shall be required to know and understand the rules which apply to the work each person is performing.

1.04 Enforcement

(a) Employees acting in a supervisory capacity either regularly or temporarily shall require all employees working under their jurisdiction to comply with all applicable safety instructions, safe practices, and safety rules.

(b) Any safety device, tool or equipment which upon inspection by the employee in charge of the job, is found unsafe or defective shall be removed from service.

1.05 Emergencies

In the event of an emergency which may result in a serious personal injury, a supervisor, foreman or employee in charge may temporarily modify or suspend any of these rules as they may consider necessary to permit proper handling of the emergency. In any such case: the person so acting shall be fully accountable for their actions.

1.06 Amendments

Revisions or amendments may only be made in the manner in which these rules were originally issued and shall be effective on the date of their issuance.

1.07 Interpretation

These rules shall be strictly interpreted to bring about maximum compliance and safe conduct and shall take precedence over any conflicting instructions that are less stringent.

1.08 Supplementary Information

Additional instructions and information relating to safe performance of work as issued through the medium of letters, operating instructions, bulletins, etc., shall be used to supplement these fundamental accident prevention rules as necessary and shall be made available to all employees.

1.09 Governmental Safety Standards

In addition to its own accident prevention rules and safe practices, the Employer and its employees in the performance of their work are subject to the regulations of various
governmental agencies including federal, state, county and city. Employees in charge shall make certain all applicable provisions of governmental regulations are complied with on their jobs.

1.10 Care in Performance of Duties

(a) Each employee shall use reasonable care in the performance of their duties and act in such a manner as to ensure at all times maximum safety to themselves, their fellow employees and the public.

(b) Employees shall not engage in practical jokes, scuffling, "horse play", or the urging of persons to take unnecessary chances.

1.11 Qualifications for Duty

(a) No employee shall attempt work for which they are not mentally and physically fit.

(b) Any employee in charge having reasonable grounds to suspect an employee under their supervision is either mentally or physically unfit for duty, shall prohibit such employee from working until satisfactory medical, or other evidence indicating fitness for duty is obtained.

1.12 Clothing

(a) Each employee shall wear a long sleeve shirt, long pants and work boots at all times to minimize danger when exposed to, moving machinery, hot or injurious substances and rough or sharp surfaces.

(b) Employees exposed to the hazards of flames or electrical arcs shall wear approved flame resistance (FR) long sleeve shirts or other FR clothing as required. Synthetic clothing (For example: acetate, nylon, polyester and rayon) other than FR designated clothing, will not be used under any circumstances. All undergarments worn will be made of natural fibers.

(c) Employees working in areas where there is a possible danger of head injury from impact, falling or flying objects, electrical shock and burns, or where specifically posted, shall be protected by the appropriate class hard hat ANSI Z89.1.

1.13 Intoxicants

(a) Use of intoxicants or illegal drugs by any employee during working hours is prohibited, and any violation will be sufficient cause for dismissal.

(b) Any employee reporting for duty while under the influence of intoxicants or illegal drugs shall not be allowed to assume their duties.

1.14 Smoking

(a) Employees shall not smoke in proximity to flammable liquids, explosives or gases, or where "No Smoking" signs are displayed.

(b) Matches, cigars, cigarettes, tobacco or other substances must not be discarded while still burning except when placed in a proper receptacle or otherwise disposed of safely.

(c) All matches or other sources of ignition shall be removed from the person of any employee before entering an explosive or combustible area.
(d) Smoking shall not be permitted in areas indicated as danger zones or areas closed by federal, state, county or city officers.

1.15 First Aid

(a) Employees shall familiarize themselves with, and become reasonably proficient in, the treatment of injuries as outlined in Section 4 of these rules.

(b) Every injured or ill person shall be given first aid as soon as possible

(c) Properly equipped and approved first aid kits shall be maintained on trucks, in attended plants or stations, and such other locations as may be considered advisable.

(d) A list of names, addresses and telephone numbers of ambulance services, physicians, and hospitals to be called in emergencies shall be provided to employees in charge.

1.16 What to Do When an Accident Occurs

The following rules covering the reporting and preliminary investigation of all accidents shall be strictly observed:

(a) Injury to Employees.

(1) When possible, at least one employee should stay with the injured person to render first aid such as; controlling bleeding, applying artificial respiration and treating for shock, until medical attention is available.

(2) When a serious injury to, or death of, an employee occurs while on duty, the first employee having knowledge shall seek help by the fastest means of communications available. It shall be made clear in the initial call whom is to summon the doctor and/or ambulance.

(3) Sufficient and accurate information must be given so the doctor, ambulance or others responding to the call will be informed of the exact location and necessary directions for reaching the scene of the accident.

(4) All injuries to, or death of, employees while on duty shall be reported in writing in accordance with employer's instructions.

(b) Accident Investigation.

(1) No equipment, machinery, tools or evidence of the accident, shall be removed from the accident site, unless a hazard or dangerous situation exists, until the Employer can secure accurate measurements, photographs and/or other vital information regarding the accident. It is the employers responsibility to promptly notify the union of all fatalities or serious accidents.

(2) Pertinent and accurate information shall be provided and submitted to Employer and Union Safety Committees.

(c) Automobile Accidents.

In all accidents involving the operation of an Employer vehicle, the Employee (driver) shall follow all federal, state and local laws, as well as employer rules and policies.
1.17 Sight Protection

Approved eye-protective devices are provided on jobs that require eye protection. Such devices should fit properly, be kept clean at all times, and shall be worn when an employee is engaged in, or in the vicinity of work involving jobs where there is danger of eye injury. ANSI Z87.1

1.18 Protection from Dusts, Fumes, Vapors or Gases

Where it is impracticable to eliminate harmful quantities of dusts, fumes, vapors or gases, every employee in the zone of contamination must be protected in a manner that will insure a supply of clean air. Otherwise, only approved respiratory equipment used by properly trained and qualified employees shall be used.

1.19 Poisons

(a) Before handling poisonous, infectious, or corrosive substances, such as acids, solvents, leads, etc., employees should thoroughly familiarize themselves with the hazards involved and utilize all necessary precautions, protective devices and/or equipment. Care shall be exercised by persons with open sores.

(b) Employees shall not handle food, tobacco, etc. with such poisonous substances on their hands.

1.20 Explosives

Only authorized and experienced employees shall handle explosives, and then only in accordance with approved and lawful methods.

1.21 Lights

(a) No artificial light, except an Employer issued light or an approved explosion-proof fixture, shall be used near escaping gas, gasoline, or other flammable vapors, or when entering a room or enclosure suspected of containing an explosive atmosphere.

(b) Dark places, such as basements, cellars, etc., shall not be entered without proper light; the use of matches or other open flames is strictly forbidden.

(c) When workers are working at night, adequate lighting shall be provided by the Employer.

1.22 Gasoline

(a) Gasoline shall be stored, handled and transported only in approved containers, and extreme care must be used at all times to prevent ignition. In addition, employees shall familiarize themselves with and observe local ordinances relative to such storage.

(b) When pouring or pumping gasoline from one container to another, contact shall be maintained between the pouring and receiving containers.

1.23 Fire Protection

(a) Employees shall be familiar with instructions relating to fire prevention and suppression, and with the location and use of all fire fighting equipment in the location where they are regularly employed.
(b) All fire apparatus shall be maintained in serviceable condition and accessible at all times.

(c) Carbon tetrachloride fire extinguisher shall not be used.

1.24 Welding, Metalizing, Soldering and Use of Open Flames

(a) Open flames shall not be brought near to, nor welding processes, brazing, flame cutting or soldering done on any empty container, tank, or other vessel which has, or may have, previously contained a flammable or explosive substance.

(b) Welding processes, flame cutting, brazing, metalizing, soldering and the use of open flames on vessels subject to possible ignition of contents, shall be done in accordance with approved procedures by fully qualified personnel who shall observe the following additional precautions:

1. Keep away from vessel openings as far as possible.
2. Provide suitable fire protection equipment adjacent to the work.
3. Hazardous areas shall be designated by signs and protected by approved barricades as required.

(c) It shall be the responsibility of the welder to see that, where practical, screens are properly placed to prevent eye injury to fellow workers and on-lookers. Helpers shall wear suitable eye protection when assisting in welding.

(d) Whenever lead, cadmium, galvanized or other toxic fume producing material is welded, burned or otherwise heated to such a degree that fumes from the metal or its fluxes are generated, the work shall be ventilated so that the workers performing the operation are not exposed to hazardous concentrations of fumes, or the workers shall be protected by approved respiratory equipment. If respiratory equipment is required to protect workers performing the operation, the following additional precautions shall be observed:

1. Sufficient ventilation shall be provided for the protection of others to prevent accumulations of harmful quantities of fumes in the work area; or
2. The operation shall be isolated; or
3. The work shall be performed outdoors, in such a location that fumes will not enter any building in harmful quantities.

(e) The use of open flames in battery rooms is prohibited except under the direct supervision of qualified and experienced personnel, and then only after the room has been well ventilated.

1.25 Compressed Gases

(a) Oil or grease shall not be allowed to come in contact with valves, regulators, or any other parts of oxygen cylinders or apparatus. (Oxygen contacting oil or grease may cause an explosion.)

(b) Portable gas cylinders or containers shall be handled with extreme care and shall be stored in a suitable, well ventilated location, properly secured in a vertical position with valve cap in place, except one-ton chlorine cylinders which shall be stored horizontally.

(c) Portable gas cylinders or containers shall not be exposed to excessive heat. Sparks and flames shall always be kept away from such cylinders or containers.

(d) Oxygen cylinders shall not be stored near cylinders containing flammable gases (hydrogen, butane, propane,
acetylene, etc.) or with oils, greases or flammable liquid.

(e) All connections to piping, regulators, and other appliances shall be kept tight to prevent leakage. Should leaks develop, never test with an open flame. When cylinders or containers are not in use, always keep valves tightly closed.

(f) Compressed gases shall not be used from a cylinder or cylinder manifold or other container unless an acceptable pressure-regulating device is installed on the cylinder, valve or manifold. Regulators shall not be required with fuel gases used from cylinders through torches or other devices, which are equipped with shut-off valves.

(g) When shipping cylinders of compressed gases, the valves shall be protected by:

1. Securely attached metal caps;
2. Boxing or crating the cylinders so as to give proper protection to the valves, or,
3. By loading the cylinders compactly in an upright position and securely bracing them.

(h) Compressed gas or welding fuel-gas cylinders in portable service shall be securely fastened to suitable trucks in an upright position with valves tightly closed before moving.

1.26 Warning Signs, Guards, Barricades, Barriers, Etc.

(a) As applicable, approved warning signs, barriers, barricades, guards, cones and flags shall be placed and properly maintained wherever hazards exist due to moving or stationary machinery or vehicles, exposed energized parts, open excavations, construction operation, open manholes or handholes, and similar exposures. In addition, lights and/or other illuminating devices shall be used at night, as required.

(b) Warning signs, barricades and flagman shall be in compliance with the governing agency having jurisdiction over the jobsite location.

(c) Where pedestrian or vehicular traffic is involved, and conditions require it, properly trained and equipped flagmen must be stationed to warn or direct traffic; however, the flagmen should exercise extreme care in the performance of their duties, and avoid unnecessary direction of traffic. Where conditions warrant, an employee shall be stationed at the surface to guard open manholes, pits, vaults or excavations.

1.27 Use of Safety Devices

All safety devices furnished by the Employer shall be properly used by all employees as required. These devices will be regularly tested as required and kept in good repair by the Employer, but this will not relieve the employee of the responsibility of using only those in good condition.

1.28 Removing Safeguards

(a) Safeguards shall not be removed except on approval of the employee in charge.

(b) Where regular safeguards are removed, they shall be replaced or suitable temporary guards provided before returning to normal operation.
1.29 **Safety Belts, Life Lines, Railings, Etc.**

(a) Employees shall use approved safety belts and straps, lifelines or other adequate protection as required when working in elevated positions.

(b) It shall be the duty of each employee to inspect each safety device prior to use, whether furnished by the Employer or Employee and they shall only use those that are in good condition.

1.30 **Safe Supports**

(a) No employee, material or equipment shall be supported on any portion of a tree, pole structure, scaffold, ladder, walkway, or other elevated structure, crane or derrick, etc., without it first being determined that such support is adequately strong and properly secured.

(b) Scaffolding shall be of sufficient strength and rigidity to support four times the weight of men and material to which it will be subjected; that is, it shall have a safety factor of at least four.

(c) Construction details of all scaffolding shall comply with applicable federal and state safety orders.

1.31 **Ladders**

(a) When working from a portable ladder, the ladder shall be securely placed, held, tied, or otherwise made secure to prevent slipping or falling.

(b) Care shall be used in placing ladders. Where possible, the horizontal distance from the top support to the foot of the ladder shall be one-quarter of the working length of the ladder (the length along the ladder between the foot and the top support) 4:1 Ratio.

(c) Ladders shall not be placed in front of doors opening toward the ladder unless the door is secured open, locked or guarded.

(d) The employee shall face the ladder and shall use both hands when ascending and descending.

(e) When standing on a ladder, the employee shall not lean to one side while working unless the ladder is adequately secured.

(f) An employee shall not stand on the top platform of stepladders or the step immediately below the top platform.

(g) Ladders with weakened, broken or missing steps, broken side rails, or otherwise defective, shall be removed from service and tagged.

(h) All portable ladders, except special purpose ladders, such as tower ladders and metal manhole ladders, shall be equipped with non-slip bases and care shall be exercised in placing them. Blocking or lashing or having the ladder held by someone may be required, especially upon oily, metal, or concrete surfaces.

(i) Wire truss portable ladders shall not be used.

(j) Portable metal ladders shall not be used in the vicinity of electric circuits. Any such ladders used for authorized purposes shall be legibly marked "Caution--Do Not Use Around Electrical Equipment."

(k) Benches, boxes, tables or other makeshift substitutes shall not be used as ladders.

(l) Wooden ladders shall be finished with clear shellac, varnish or other clear finish only. Paint shall not be used.
which might obscure a defect in the wood.

1.32 Tools

(a) Employees shall use proper tools suitable for the job in progress and only those in good repair. Defective tools shall be removed from service and tagged.

(b) Proper handles shall be fitted to tools where required.

(c) Tools and other materials shall not be left lying in elevated positions, unless protected from falling.

(d) Cutting tools shall be kept properly sharpened and cutting edges guarded with scabbards or other safe storage provided when not in use.

(e) Metallic tapes or metallic rules shall not be used near exposed energized electrical equipment. Cloth tapes with metal reinforcing shall not be used under any circumstances.

1.33 Housekeeping

(a) Combustible materials, such as oil-soaked and paint-covered rags, waste, shavings, packing and rubbish shall not be allowed to accumulate on benches, bins, floors, yards, or vehicles, except in suitable containers in areas provided therefore.

(b) Floors, stairways and platforms shall be reasonably free of dangerous projections or obstructions and shall be maintained in good repair, and reasonably free from oil, grease, or water. Where the type of operation necessitates working on slippery floor areas, such surfaces shall be protected against slipping by the use of mats, grates, cleats or other methods employed to provide equivalent protection. Floors, stairways and platforms shall be constructed and maintained to safely support the loads to which they are subjected.

(c) Stairways, aisles, exits, roadways and walkways in material storage areas shall be kept reasonably clear and free from obstructions, depressions and debris.

(d) Material and supplies shall be stored in an orderly manner to prevent their falling or spreading and to eliminate tripping and stumbling hazards.

(e) Compressed air shall not be used for cleaning purposes, unless an approved pneumatic blowgun is used, limiting pressure to 30 psi.

(1) Compressed air shall not be used to clean the clothing or hair, or be turned against any person for any reason.
1.34 Lifting Material or Equipment

(a) When lifting, take a firm grip; secure good footing; place the feet a comfortable distance apart; bend the knees; keep the back straight; and lift with the leg muscles,

(b) Never carry a load that obstructs the vision.

![Correct Lift Diagram](image1)

![Incorrect Lift Diagram](image2)

Arrows indicate points of greatest strain

Figure 1 - Correct Lift

Figure 2 - Incorrect Lift

(c) Use gloves or hand pads as required when handling materials.

(d) Secure help when needed. Use cranes or hoists for lifting heavy loads. Keep out from under suspended loads.

1.35 Packing, Unpacking, Storage, Loading and Unloading of Materials

(a) Nail points, ends of wires or bands shall not be left exposed when packing or unpacking boxes, crates, barrels, or other containers.

(b) Nails shall be removed from loose lumber, the points bent down, or the lumber shall be disposed of so that it will not become a hazard.
(c) Sharp or pointed articles shall be so stored as to prevent persons from coming in contact with the sharp edges and points.

(d) Care shall be exercised when packing or unpacking glassware, porcelain and other fragile objects which may have sharp edges.

(e) Loads shall not be handled from the street side of a vehicle if it can be avoided.

(f) Special regulations and instructions governing the loading and unloading of poles, pipes, etc., shall be strictly observed in every case.

1.36 Transportation

(a) Employees shall not ride on fenders, running boards, side rails, truck bed or on top of vehicles.

(b) Employees shall ride in the space provided in employer vehicles and shall not ride with their legs hanging out of the rear or side of any vehicle.

(c) All sharp tools, such as saws, chisels, axes, knives, etc., carried on vehicles shall be so stored or guarded to prevent injury to workers.

(d) Before proceeding, drivers shall make certain that all loads are properly secured, that riders are properly located to prevent falling from the vehicle and are not exposed to hazards from shifting loads.

(e) Employees shall not get on or off vehicles in motion.

(f) Drivers shall not permit more employees to ride on the seat than the number for which the seat was constructed.

(g) Where provided, employees shall use automotive seat belts, properly fastened, at all times while driving or riding in the following Employer vehicles:

   (1) All passenger vehicles and trucks.
   (2) Construction equipment, when the equipment is being "roaded."
   (3) Construction equipment, (such as tractors, loaders, trenchers and tampers) when provided with both seat belts and a canopy, roll bars, or similar roll over protection.

   (Exception: Seat belts need not be worn by employees using this type of equipment when it is necessary for the employee to operate the equipment from a position other than sitting in the normal seat provided.)

1.37 Cranes, Hoists and Derricks

(a) Cranes, hoists, and derricks shall be operated only by qualified and authorized persons.

(b) When mobile hoists, cranes, booms, or other similar lifting devices are used near energized equipment, all persons shall remain in the clear until the equipment is in a safe position. The person in charge shall check and determine that all persons remain in the clear while the vehicle is being moved or the boom is being repositioned.

(c) Employees shall not ride on loads suspended from cranes, hoists, and derricks.

(d) A sign shall be posted in the cab of all outdoor portable cranes, hoists, and derricks reading essentially as follows:

"Unlawful to operate this equipment within 10 feet of high voltage lines of 50,000 volts or less. The above clearances do not apply to authorized work by qualified electrical workers on or near energized high-voltage
conductors or apparatus."

(e) Operators shall not move loads over the heads of workers or others unless authorized by the employee in charge. Operators shall not leave cranes, hoists, or derricks unattended while load is suspended, unless suspended over a barricaded area, blocked or otherwise supported from below during repair or emergency.

(f) No crane, hoist, or derrick shall be loaded in excess of its rated capacity.

(g) Crane, hoist, or derrick operators shall take signals only from the person designated by the employee in charge.

(h) Uniform hand signals shall be used to signal overhead traveling cranes, and uniform signals for derrick and crane operators shall be used. The appropriate chart shall be conspicuously posted in the vicinity of hoisting operations (cage or cab if so equipped) depicting and explaining the system of signals to be used.

(i) Portable cranes, hoists and derricks shall be positioned, equipped, protected, and/or operated so that no part comes closer to energized power lines than indicated in the below table:

<table>
<thead>
<tr>
<th>Nominal Voltage kV</th>
<th>Minimum Required Clearance (Ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.6 to 50</td>
<td>10 ft.</td>
</tr>
<tr>
<td>50 to 75</td>
<td>11 ft.</td>
</tr>
<tr>
<td>75 to 125</td>
<td>13 ft.</td>
</tr>
<tr>
<td>125 to 175</td>
<td>15 ft.</td>
</tr>
<tr>
<td>175 to 250</td>
<td>17 ft.</td>
</tr>
<tr>
<td>250 to 370</td>
<td>21 ft.</td>
</tr>
<tr>
<td>370 to 550</td>
<td>27 ft.</td>
</tr>
<tr>
<td>550 to 1,000</td>
<td>42 ft.</td>
</tr>
</tbody>
</table>

Note: These clearances do not apply to such equipment when used for authorized work on overhead and underground conductors, structures, or appurtenances by qualified persons.
Uniform Hand Signals For Overhead Traveling Cranes

<table>
<thead>
<tr>
<th><strong>TRAVEL</strong></th>
<th><strong>MOVE SLOWLY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm Extended, Slightly Raised, Hand Closed, Forefinger Extended. Make Motion in Direction of Travel</td>
<td>Clenched Fist Above Head—Make a Stopping or Halting Motion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>RAISE HOIST LINE</strong></th>
<th><strong>USE MAIN HOIST</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Closed, Forefinger Up, Circular Motion</td>
<td>Top Fist on Head, Then Use Regular Signals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>LOWER HOIST LINE</strong></th>
<th><strong>USE AUX. HOIST</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Closed, Circular Motion, Forefinger Down</td>
<td>Top Fist with One Hand, Then Use Regular Signals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>STOP</strong></th>
<th><strong>OR</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm Raised, Hand Open</td>
<td>Hand Open, Palm Down</td>
</tr>
</tbody>
</table>

*Select Either Signal, Use Selected Signal Throughout Operation*
Uniform Hand Signals For
Mobile Type Cranes and Derricks

<table>
<thead>
<tr>
<th>LOWER OUTRIGGERS</th>
<th>RAISE BOOM</th>
<th>LOWER BOOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands Open, with</td>
<td>Hand Closed,</td>
<td>Hand Closed,</td>
</tr>
<tr>
<td>Downward Motion</td>
<td>Thumb Up</td>
<td>Thumb Down</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RAISE OUTRIGGERS</th>
<th>EXTEND BOOM</th>
<th>RETRACT BOOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands Open, with</td>
<td>Hand Closed,</td>
<td>Hand Closed,</td>
</tr>
<tr>
<td>Upward Motion</td>
<td>Two Fingers Up</td>
<td>Two Fingers Down</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RAISE HOIST LINE</th>
<th>ROTATE BOOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Closed, Forefinger Up, Circular Motion</td>
<td>Hand Closed, One Finger Pointing in Direction of Movement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOWER HOIST LINE</th>
<th>STOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Closed, Forefinger Down, Circular Motion</td>
<td>Arm Raised, Hand Open</td>
</tr>
</tbody>
</table>

- OR -

<table>
<thead>
<tr>
<th>TRAVEL</th>
<th>USE AUX. HOIST</th>
<th>USE MAIN HOIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm Extended, Slightly Raised, Hand Closed, Forefinger Extended - Make Motion in Direction of Travel</td>
<td>Top Elbow with One Hand, Then Use Regular Signals</td>
<td>Top Fist on Head, Then Use Regular Signals</td>
</tr>
</tbody>
</table>

*Select either signal, use selected signal throughout operation.*
1.38  Tailboard Briefing

Tailboard briefing means "tailboard conferences", "job procedure discussion" or talking the job over before starting to work, so that all supervisors and members of each crew involved thoroughly understand the job to be done and the method of accomplishing it. Before starting each job the employee in charge shall call the crew together for a few minutes and outline the proper work procedure to be followed in such a manner that the following will be accomplished:

(a) Each person will understand the purpose of the job. In other words, what they are going to accomplish.
(b) Each person will understand what they are to do.
(c) Each person will understand what the other members of the crew are to do.
(d) Each person will understand the manner in which the employee in charge intends to carry out the job.
(e) Each person will understand the hazards or trouble spots involved and will know how the employee in charge is proposing to overcome such problems.
(f) Each person will be aware of the physical location of the job, to relay that information to emergency responders in the event of an accident.

1.39  Clearances

Before any employee starts work on any equipment or apparatus for which clearances are required, the employee shall either obtain a clearance, or report to and work under a qualified employee who holds a clearance on the equipment or apparatus involved.
Section 2.0  
Electric Transmission  
and Distribution Overhead

2.01 Scope

These rules shall apply to all personnel engaged in overhead electric Transmission or Distribution work.

2.02 Energized High-Voltage Conductors or Apparatus - Qualified Electrical Workers

Journeymen working on, near and including above energized lines or equipment of over 600 volts shall be assisted by another journeyman or hot apprentice, one to one, on the same pole, a suitable aerial insulated platform, structure or location. It is also permissible for the work to be performed by one journeyman/hot apprentice on the pole and one journeyman/hot apprentice in a suitable aerial insulated platform. (Two separate poles or structures may be considered one for the purpose of this rule if both men can step to the other pole or structure without descending to the ground to render immediate assistance.)

Observers. During the time work is being done on, near or above any exposed conductors or exposed parts of equipment connected to high-voltage systems, a Qualified Electrical Worker, or Hot Apprentice shall be in close proximity at each work location to:

(1) Act primarily as an observer for the purpose of preventing an accident, and

(2) Render immediate assistance in the event of an accident.

2.03 Energized Low-Voltage Conductors or Apparatus

No employee shall touch any exposed conductor or apparatus energized at less than 250 volts, phase to ground, unless suitable personal protective equipment such as approved rated insulated gloves or tools are used. For voltages of 250 volts to 600 volts the use of approved rated insulated gloves is mandatory. Leather gloves are not considered an approved insulating device.

2.04 Working Distance

(a) The following table lists the minimum working distance from energized conductors or apparatus, which are not properly covered with approved protective equipment. This includes reaching, falling, extended, material or equipment.

<table>
<thead>
<tr>
<th>Kilovolt</th>
<th>Minimum Approach Distance (MAD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 0.6 to 15</td>
<td>2 ft. 1 in.</td>
</tr>
<tr>
<td>Above 15 to 36</td>
<td>2 ft. 4 in.</td>
</tr>
<tr>
<td>Above 36 to 46</td>
<td>2 ft. 7 in.</td>
</tr>
<tr>
<td>Above 46 to 72.5</td>
<td>3 ft. 0 in.</td>
</tr>
<tr>
<td>Above 72.5 to 121</td>
<td>3 ft. 4 in.</td>
</tr>
<tr>
<td>Above 121 to 145</td>
<td>3 ft. 7 in.</td>
</tr>
<tr>
<td>Above 145 to 169</td>
<td>4 ft. 0 in.</td>
</tr>
<tr>
<td>Above 169 to 242</td>
<td>5 ft. 3 in.</td>
</tr>
</tbody>
</table>
Above 242 to 362  |  8 ft. 6 in.
Above 362 to 552  |  11 ft. 3 in.
Above 552 to 765  |  15 ft. 0 in.

(b) Nothing in this rule shall prohibit working on conductors or apparatus energized up to 21,000 volts, normal phase to phase, with approved protective equipment.

(c) The above safe working distance does not apply to energized conductors or apparatus protected by a suitable barrier or properly covered with approved protective devices. However, intentional contact shall not be made with protective covering, except for installation or removal.

2.05 Pole-Mounted Apparatus

(a) All cutouts and disconnects shall be operated with a fuse or switch stick, or approved telescoping live-line tool.

(b) Contact with transformer, capacitor, regulator or oil switch cases, bond wires, hardware supporting primary voltage insulation and other apparatus shall be avoided except when tested and grounded or worked upon with approved devices.

(c) Pole-mounted potheads shall not be transferred while energized.

2.06 Grounding Overhead Lines

(a) Any exposed de-energized part of a line normally operated at a voltage in excess of 600 volts, phase to phase, shall not be worked on until the normally energized parts have been proven to be de-energized and all conductors of the circuit have been short-circuited and grounded against all possible sources of energy. Energized high-voltage lines, which cross over or under a de-energized line, shall be considered possible sources of energy.

(b) Only approved grounding devices shall be used. Protective grounding equipment shall be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault. This equipment shall have an ampacity greater than or equal to that of No. 2 AWG copper.

(c) There shall be a minimum of one ground on the conductor or equipment being worked on:
   (1) Between the place where the work is being done and each possible source of supply, or
   (2) A ground equipotential zone created at each work location, or
   (3) Bracket grounded with an equipotential zone

Exception: In Nevada, only numbers 2 & 3 above may be used.

(d) Portable grounding devices shall be secured to permanently grounded objects at the location selected for grounding in the following order of preference:
   i. Substation ground grid
   ii. 4-Wire multi grounded primary neutral
   iii. Grounded steel structure
   iv. Anchor Rod
   v. A temporary ground rod/screw ground to a minimum depth of 4 feet
2.07 Use of Rubber Protective Equipment

Electrical protective equipment shall be maintained in a safe, reliable condition. The following specific requirements apply to insulating blankets, covers, line hose, gloves, and sleeves made of rubber:

1) Insulating equipment shall be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves shall be given an air and water test at the beginning of each work period or as needed, along with the visual inspection.
   a) Check for laboratory test date and issue date. (refer to section 2.20 (3))
   b) Blankets should be inspected stretched and rolled to check for damage or weather checking
   c) Line Hose and hoods should be turned inside out and visually examined for cuts and/or other defects.
   d) At no time shall any rubber goods or protective equipment be used with any kind of patches on them.

2) Insulating equipment with any of the following defects may not be used:
   a) Holes, tear, puncture, or cut;
   b) Ozone cutting or ozone checking (the cutting action produced by ozone on rubber under mechanical stress into a series of interlacing cracks);
   c) An embedded foreign object;
   d) Any of the following texture changes: swelling, softening, hardening, or becoming sticky or inelastic.
   e) Any other defect that damages the insulating properties.

3) Insulating equipment found to have other defects that might affect its insulating properties shall be removed from service and returned for testing.

4) Insulating equipment shall be cleaned as needed to remove foreign substances.

5) Insulating equipment shall be stored in such a location and in such a manner as to protect it from light, temperature extremes, excessive humidity, ozone, and other injurious substances and conditions. (ie. sharp object or other abrasive materials).
   a) Rubber gloves and sleeves shall be stored in an approved glove bag.
   b) Blankets shall be rolled and not folded when being stored.

6) Rubber Glove protectors shall be worn over all insulating gloves

2.08 Climbing Equipment

(a) Climbers shall not be used after the gaffs are worn or filed to less than 1 1/4 inches long, measured on the underside of the gaff.

(b) Climbers shall be worn only when engaged in work requiring their use and shall never be worn when: driving or riding in a vehicle; setting, removing or handling poles; working on the ground; or while working on floors or roofs.
2.09 Working in Elevated Positions

(a) Before climbing poles or structures, or approaching the overhead work area, employees shall familiarize themselves with the circuits and apparatus thereon and any unusual conditions which might present a hazard.

(b) Not more than one employee shall ascend or descend a pole at the same time. The first employee shall be in place on the pole or on the ground before the next employee ascends or descends the pole. When it becomes necessary for one employee to work above the other, they shall exercise extreme care.

(c) Before climbing poles, ladders, scaffolds, or other elevated structures, or riding span wires, messengers or cables, or entering cable cars, boatswains' chairs or similar equipment, the employee shall first assure themselves that said structure or device is strong enough to safely sustain their weight.

(d) Employees shall observe the pole brand to assist in evaluating that the pole is set to proper depth. (Manufacturers usually place their pole brand 10 feet from the butt end of poles 50 feet and under and 13 feet on poles 55 feet and over.)

(e) When working out of a bucket truck, employees shall use a body harness, ANSI Z359 approved, with a shock absorbent lanyard.

(f) The personal use of cell phones while working in elevated positions is prohibited.

2.10 Belts and Safety Straps and Harnesses

(a) Only ANSI Z359 approved safety straps, body belts and full body harnesses shall be used.

(b) Employees shall not work on an erected pole, tower or other elevated structure, including truck-mounted ladders and mechanical or hydraulic platform lifts, without first securing themselves with an approved safety strap or life line.

(c) Employees working in aerial lifts SHALL SECURE THEMSELVES to the attachments provided.

(d) Employees shall look to make sure that the snap hook and "D" ring are properly engaged before the weight of the body is placed on the safety strap. Employees shall never rely on the "click" of the keeper in the snap as an indication that the fastening is secure.

(e) When a safety strap is in use, both snap hooks shall not be attached to the same "D" ring.

(f) Wire hooks shall not be attached to body belts.

2.11 Hand Lines

(a) An approved hand line shall be placed on every structure where line work is being performed on energized primary conductors or apparatus.

(b) An approved line with a minimum breaking strength of 2650 lbs. may be used when lowering a person from a pole or elevated position, provided the rope is passed over a cross-arm or fixed member of the structure and is not directly supported by the hand line sheave.

(c) When raising or lowering tools or lightweight material, a hand line, or hand line with material bag attached thereto, shall be used.
Testing Poles and Stubs

When the employee in charge determines that a pole shall be tested, the tests shall be made as follows:

(a) Make a close visual inspection and a hammer test for any physical defect, which might weaken it.

(b) Expose to at least 12 inches below ground on one side of the pole and inspect for defects as noted in (a) above. If set in pavement, test by boring as outlined in sub-paragraph (c) below, except start the drill hole as close to the pavement as possible.

NOTE: If it is evident that the pole is defective after either of steps (a) or (b), further testing is not necessary and the pole shall be adequately supported before climbing.

(c) Poles: Bore a 9/16 inch hole at the center line of the pole at the bottom of the excavation at a 30 to 40 degree angle with the surface of the pole, to within about 2 inches of the opposite side, taking care not to break through. If the soundness of the pole is questionable after the first boring, bore a second hole at right angles to the first at ground level. If the soundness of the pole is questionable at this point, it shall be adequately supported before climbing. The drill holes shall be plugged with a 5/8 inch approved plug.

(d) Stubs: Wood and steel stubs used to reinforce wood poles at the ground line shall be treated as part of the pole and tested as determined necessary. The testing shall be performed as follows:

1. The metal stubbing bands for both wood and steel stubs shall be inspected and the pole shall be checked for soundness above and below each band. The bands must be in good condition and shall be tight.

2. Wood stubs shall be considered as part of the pole and tested as outlined in Rule 2.13(a) through (c).

3. Galvanized steel stubs shall be checked for soundness by visual inspection at the ground line for rust or corrosion. If rust is detected, the stub shall be exposed a minimum of 12 inches to determine the extent of corrosion. If corrosion has not penetrated more than the surface metal and extends less than 1/3 the perimeter of the stub, it shall be sounded with a hammer, if found solid, be considered of adequate strength to support the pole. If corrosion has penetrated the surface and extends the full perimeter of the stub, or it is not possible to determine the extent of corrosion, the pole shall be adequately supported before climbing.

Blasting Pole Holes

(a) All blasting of holes for power lines shall be done by competent and authorized employees.

(b) The employee in charge shall instruct all persons to keep "in the clear" before and during blasting operations.

(c) Three distinct audible warnings shall be given before blasting.

(d) Lead wires and firing lines shall be short-circuited up to the time they are connected to the firing mechanism.

(e) All loaded holes shall be properly tamped with earth, using a wooden rod.

(f) Blasting under power lines, or where damage to property is a possibility, shall not be done without approval from at least a second-level Supervisor, and then only as follows:

1. When it is impractical to dig otherwise.

2. Collars shall be dug as far as practicable and holes shall be covered with a mat or equivalent which shall
be securely tied down or weighted down to prevent materials being blown into line.

(3) Lead wires shall not be run parallel to the power line and shall be securely anchored.

(g) Electric blasting caps and explosives shall be transported in accordance with applicable Governmental Codes or Regulations.

(h) No electric blasting shall be performed within 100 feet of a transmitting radio. For minimum safe distance from radio stations, see applicable Governmental Safety Regulations.

2.14 Setting or Removing Poles

(a) All persons not engaged in pole setting operations shall be kept out of the work area.

(b) No one shall be allowed on a gin pole when it is being used to raise another pole.

(c) When setting or removing poles between or near exposed energized conductors, where danger of contact with conductors or equipment may exist:

(1) i. Ground wires, guy wires or metallic hardware running the length of the pole shall not be attached to the pole.

   ii. The conductors shall be spread to minimize accidental contact or covered with approved protective devices or the pole shall be covered with an approved guard or the conductors shall be de-energized.

(2) All personnel who may handle the butt of the pole shall wear approved lineman's rubber gloves whether or not cant hooks or slings are used.

(3) No one shall step on or off the truck, or touch any part of the truck or associated equipment from the ground, while the pole is being set, or until it is secured in such a manner that it could not possible come in contact with energized conductors or apparatus.

(4) Guy ropes may be used to control the pole.

2.15 Common Neutral Systems

(a) The common neutral conductor shall not be opened at any point except by first installing an approved temporary jumper around the proposed open point.

(b) Common neutrals at the secondary level shall be worked on as conductors or apparatus energized at less than 250 volts, phase to ground, in accordance with Rule 2.03.

(c) The vertical run connecting the common neutral at the primary level shall be considered as secondary and worked in accordance with Rule 2.03 except that portion located at less than the safe working distance from exposed energized parts, in which case it shall be considered as primary and worked as such. In all cases primary neutral line conductors and jumper wires shall be considered and worked as primary.
2.16 Wire Stringing

(a) When stringing or taking down wires, the number of persons actually handling the wire at any one time shall be held to a minimum. Running lines, hold down lines, and tag lines shall be used and left attached until the wires are in place and properly secured. It is the duty of the employee in charge to see that such means of protection are adopted as are necessary to make the work safe.

(b) When stringing or taking down wire along or over streets or highways, the equipment pulling the wires shall be provided with flags, front and rear. Other precautionary measures, such as flagmen, cradles, and barriers shall be used as required.

(c) When stringing or taking down wires from above or below unattached energized lines or on poles or towers on which there are attached energized lines, precautions shall be taken to adequately insulate the employees from the wire or wire stringing equipment or other approved methods. Employees shall not contact wire-stringing equipment in a manner, which would permit their bodies to become a parallel path to ground. In addition to the above requirements, bare wires (except bare neutrals in multi-conductor cables) shall be pulled over grounded rollers at the first pole or second pole from the payout and take-up equipment. The metal frame of the wire stringing equipment shall be bonded to the traveling ground.

NOTE: Service drops are excluded from the above section (c) as they pertain to the use of grounded rollers and traveling grounds. When stringing parallel to lines energized in excess of 35kV the conductor being installed or removed shall be pulled over grounded rollers at the first structure adjacent to both the tensioning and pulling set-up.

(d) When stringing or taking down wires crossing over energized lines, suitable protection or guards shall be installed at the point of crossing as necessary.

(e) Radio communications shall be maintained at all times during the actual stringing of wire. If radio contact is lost between the puller and the tensioner operators, the puller operator shall bring the pull to a gradual stop, and shall not start the pull until radio communications are restored.

2.17 Capacitors

(a) Before any work is done on switched or fixed capacitor installations, the circuit breakers and/or fuse cutouts shall be opened, using load break devices where applicable. After waiting five minutes, using live-line tools the capacitor terminals shall be shorted by means of approved temporary jumpers. The shorted terminals shall also be securely bonded to the capacitor cases. Whenever practical, the short circuit and bond shall be left on until all work is completed. If the primary taps from the cutouts or circuit breakers to the line conductors are not removed, portable grounds shall be placed on the leads from the cutouts or circuit breakers to the capacitor terminals.

(b) On all primary voltages live line tools, or other approved devices, shall be used while installing temporary jumpers.

(c) Before any work is done on capacitors installed on secondary circuits without cutouts or switches, the capacitors shall be de-energized and cleared as provided for in Rule 2.18, using approved rubber gloves.

2.18 Apparatus Leads

When working on de-energized apparatus normally energized above 7,500 volts, phase to phase, the conductors between the open switch or fuse holders and the apparatus shall be grounded. When it is impracticable to ground as above, the taps shall be removed from the line with live line tools.
2.19  **Secondaries, Banked**

Where secondary’s of transformers are banked or there is a possibility of a back-feed, the transformer secondary leads shall be disconnected in addition to removing primary fuses or disconnecting the primary leads from the line before any work is done on the transformer.

2.20  **Rubber Gloving to 21kV**

**A. Equipment**

1. Class 2 at minimum rubber gloves, with protectors, shall be worn on voltages up to 17kV phase to phase. Class 3 at minimum rubber gloves shall be worn while working on energized conductors from 17kV up to 21kV phase to phase.

2. It shall be mandatory that sleeves of the same voltage rating as the rubber gloves be worn when working on energized conductors or apparatus above 7,500 volts phase to phase.

3. The dielectric testing on gloves, sleeves, blankets, hoods, matting and line hose will be performed following “ASTM standards on electrical equipment for workers”. Gloves and sleeves will be changed out on a 90-day cycle from the date they are issued for retesting. Blankets will be changed out on a 180-day cycle from the date they are issued. The shelf life of these items shall not exceed 6 months from the last test date. Suitable means of identifying the issued dates of gloves, sleeves and blankets shall be required on this equipment. Any items that the employee feels need to be changed out will be done without question, even if it is before the due date. Rubber Gloves and sleeves that have been issued once will not be re-issued to another employee until they have been re-tested.

4. Gloves, sleeves and blankets shall not be folded while in storage; however, blankets shall be permitted to be rolled for storage. All rubber goods, when not in use shall be kept in approved glove bags or other approved containers and stored where they will not become damaged from sharp objects, direct sunlight, steam pipes, radiators and other sources of excess heat.

5. Rubber gloves shall never be worn inside out or without approved glove protectors. Protectors shall be used only in conjunction with rubber gloves. They shall not be worn by anyone for work gloves. Rubber gloves shall be air and **water** tested at the beginning of each work period or as needed. All insulating equipment shall be visually inspected for defects and cleaned prior to use each day. It must be noted that cuffs are generally susceptible to the most damage and must be stretched to detect abrasions and weak spots.

6. No patches will be allowed on any insulating equipment. If a piece of insulation is found to be defective it will be removed from the job immediately.

7. Bucket trucks and boom trucks used in rubber gloving procedures shall require an annual dielectric test after every major or periodic inspection, using the manufactures and the ANSI/SIA A92.2-(2001) 5.4.2.4 (lower boom) and 5.4.3.1 (upper boom) category A&B testing requirements. This requirement shall not supersede any additional manufacture requirements. A sticker or label shall be prominently displayed on each piece of tested equipment indicating the last test date.

8. All elbow type bucket trucks used in rubber gloving procedures shall have both insulated upper and lower booms. Both insulated booms shall be tested.

9. All bucket trucks used in rubber gloving procedures will be equipped with bucket liners with a liner bottom protector installed. The bucket liners will be tested on an annual basis following the ANSI A92.2 (2001) paragraph 5.4.3.5 or 5.4.2.5 standards.
10. All operators of aerial devices shall be trained to operate such equipment as per ANSI/SIA A9.2.2 (2001) 8.12. If they have not operated the equipment for a period of 12 months, they will be required to be re-trained.

11. When using fiber strap hoists, an approved insulated link stick shall be installed between the hoists and any other surface with a different potential. Fiber strap hoists shall be kept clean, dry and in good repair.

12. Jumpers with or without pickup heads shall be considered un-insulated. If the jumper cable cannot be isolated so there is not a possibility of contact with personnel, other conductors, poles, cross arms or hardware, the jumper cable shall be covered with line hose or blankets in the same manner as other conductors would normally be covered.

B. WORK PROCEDURES FOR RUBBER GLOVING

1. Before any work is to be done:
   
   (a) A complete tailboard will be held to ensure that all personnel are aware of the work and associated hazards.
   
   (b) All rigging will be checked and assured to be in good working order and appropriate for the work being performed.
   
   (c) All rubber goods and high voltage protective equipment will be checked to verify safe condition.
   
   (d) Immediately prior to using aerial devices for high voltage rubber glove work all insulated portions will be visually inspected and wiped clean.
   
   (e) All energized conductors or equipment within reaching distance shall be covered with approved protective equipment or floated free from the pole except those parts that are actually being worked on.
   
   (f) When work is performed on energized primary conductors, all other conductors, neutral grounds and potential grounds within reaching distance shall be covered with approved protective equipment, this includes cross-arms and pot heads.
   
   (g) Where possible and upon request of the crew, the automatic re-closer shall be made non-automatic.
   
   (h) When an energized primary conductor is placed on the cross-arm or against the pole, it shall be covered with a line hose; in addition, the cross-arm or pole shall be covered with approved protective devices.
   
   (i) When work is being performed on energized conductors, the work shall be confined to only one phase of a circuit at a time and to one work location unless it is a coordinated job involving more than one structure. The job shall be so coordinated that the personnel are safeguarded from unexpected changes in working distances due to the moving of conductors or equipment. If working distances are changed, the work shall stop until the changes are made, and all personnel on the job are made completely aware of these changes.
   
   (j) All grounded members such as secondary’s; neutral conductors, guy wires, telephone wires or cable etc. (2nd point of contact) within reaching distance of the employee shall be covered with approved protective equipment.
   
   (k) Pedestrians will be diverted around the work area and kept out of the danger area under the pole or structure.
   
   (l) Rubber gloving shall not be performed whenever the majority of Journeyman Lineman certified in rubber glove procedure and policy determine that it would be unsafe to do so.
(m) Weather conditions for the day shall be considered if inclement weather develops after work has begun and the job must be completed, the live line tool method shall be used, or the circuit shall be de-energized.

(m) Any work that may produce an arc will require the use of an appropriately insulated hot stick. Such work shall include opening switches; installing or removing energized jumpers under load, grounding, etc.

(n) A full complement of hot sticks and attachments will continue to be maintained on the crews.

(o) No conductive tools, equipment or material shall be allowed to hang on the outside of the buckets. Caution should be used to ensure the manufactures weight capacities of the aerial lift are not compromised. (p) Electric cords shall not be allowed in the primary zone.

2. Gloving from Insulated Buckets:

   (a) All ground personnel will be familiar with bucket truck rescue techniques. The ground personnel will be familiar with the lower boom controls.

   (b) During rubber gloving procedures, the bucket trucks will be barricaded. All ground personnel will be instructed in the hazards of contacting the bucket truck if the truck should become energized. Barricades may include cones, caution tape and other similar devices.

   (c) When working from a bucket, personnel shall safety-off to the special attachments provided for that purpose and shall keep their feet on the floor of the bucket at all times.

3. Gloving from Structures:

   (a) Gloving on energized conductors above 7,500 volts phase to phase from wooden poles or grounded structures shall not be permitted unless working from an approved insulated platform. When an approved insulated platform is used, it shall be rated for such work and have a dielectric test performed annually or anytime the platform is in question. The platform will be equipped with an approved manufacturer attachment point to attach a safety. The pole will be insulated when the work to be accomplished is within reaching distance of the pole.

   (b) Conductive equipment or material shall not be passed between a pole or structure and an approved insulated platform while an employee working from the platform is within reaching distance of energized conductors or equipment that are not covered with insulating protective equipment.

4. Combination Rubber Glove/Live Line Tool Methods

   (a) When work is to be accomplished through both the use of Live-Line Tools and Rubber Gloving procedures, the primary zone must be observed. The Live-Line tools in conjunction with Rubber Glove procedures is to be limited to situations where the safety margins are not decreased by the introduction of Live Line Tools into the Rubber Glove environment

The following are minimum combinations allowed when working aloft.

1. Two qualified employees in an insulated bucket or on insulated platform(s).

2. One qualified employee in an insulated bucket and one qualified employee on an insulated platform.
3. One qualified employee on an insulated bucket using Rubber Gloves and one qualified employee on the pole utilizing Live Line tools.

The following combination is prohibited:

1. One qualified employee on the pole utilizing Live Line Tools and one qualified on an insulated platform utilizing Rubber Gloves.

If Live-line tools are to be used in conjunction with Rubber Glove techniques, the tailboard briefing shall clearly establish how the work will be conducted so that safety at the work site will not be compromised.

C. PPE AND CLOTHING:

1. When in the Primary Zone:

   (a) Each employee shall wear a flame resistant (FR) long sleeve shirt with the sleeves rolled down and buttoned or other FR clothing as specified by the customer, long pants and work boots at all times to minimize danger when exposed to live electrical equipment or lines. **Synthetic clothing (for example: acetate, nylon, polyester and rayon) (other than FR clothing) will not be used under any circumstances**.

   (b) All undergarments worn will be made of natural fibers.

   (c) Hard Hats that meet the ANSI Z89.1 dielectric standards will be worn. No metallic buttons, stickers or other devises will be worn on hard hats at any time.

   (d) No metallic objects will be worn any time the worker is in the primary zone. All rings, watches, necklaces, or other jewelry will be removed before entering the primary zone.

   (e) Approved ANSI Z87.1 safety glasses shall be worn continuously during all work operations.

Primary Zone: The area or work that is within reach of the Minimum Approach Distance (MAD) from energized conductors or equipment.
Section 3.0
Use, Maintenance and Care of Live Line Tools

3.01 Use

(a) All conductors or apparatus energized above 21,000 volts, nominal phase-to-phase voltage, shall be handled only with live line tools.

(b) When working on energized conductors or apparatus with live line tools, two Journeymen electrical workers, or one Journeyman and a hot apprentice (working under continuous supervision and instruction of a Journeyman) shall be assigned to do the work.

(c) Planned work with live line tools shall not be started during unfavorable weather.

(d) Only approved live line tools shall be used.

(e) A careful check shall be made to see that the condition of the structure and lines at the point of the work is such that the job may be performed safely. In addition, the adjacent spans and structures shall be carefully checked for defects in conductors, tie wires, insulators, and other equipment.

(f) Under no circumstances shall a lineman depend on another lineman to hold a line conductor clear of him.

(g) Positive control shall be maintained during the movement of any conductor.

(h) While live line work is in progress, no other work of any nature shall be performed on the same pole or structure.

(i) A hot stick shall be the right length and strong enough to take the strain.

3.02 Care and Maintenance

(a) All live line tools, when not in use, shall be kept in live-line tools bags or weatherproof boxes provided for that purpose; these containers shall be stored in a dry and, if possible, warm place.

(b) Live line tools and plastic cover shall never be laid directly on the ground or against sharp object. Special tool holders or tarpaulins shall be used for this purpose.

(c) All live line tools and plastic cover shall be visually inspected before use each day. Tools and plastic cover to be used shall be wiped clean, and if any hazardous defects are indicated, these tools and/or plastic cover shall be removed from service.

(d) Guard against scratching or otherwise marring the surface of the live-line tool. Live-line tool fittings that are bent or dented must be replaced.
Section 4.0  
First Aid

4.01 Scope

These rules shall apply to all Company employees.

4.02 Purpose

First aid is the immediate care given by employees to the victim of an injury or sudden illness until the arrival of qualified assistance. It includes self-help and home care if medical assistance is not available.

4.03 Definitions

First Aid is the immediate care given to a victim of an accident or sudden illness at the scene of the incident.

Blood Bourne Pathogens are pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV).

4.04 General

a. Every employee should have knowledge of First Aid and CPR skills. The following procedures are general in nature and are intended as a refresher.

b. Taking action in an emergency situation is very important. Refer to the following
   Emergency Action Steps:
   1. Check the scene and the victim.
   2. Call 9-1-1 or use your mobile radio.
   3. Care for the victim.

c. Check: to be sure the scene is safe. Don't put yourself in danger.

   1. What happened?
   2. How many victims are there?
   3. Is there anyone that can assist?
   4. Call: 9-1-1 or EMS (Emergency Medical Services)
   5. Give the exact location.
   6. Telephone number you are using.
   7. Your name.
   8. What happened?
   9. How many people are involved.
   10. Is this a confined space rescue?
   11. Victim's condition.
   12. What type of first aid is being given.
   13. Don't hang up until they have all the necessary information.

d. Care: for the victim.

   1. Always ask permission before giving care.
   2. If the person is unconscious or unable to respond, permission is implied.
   3. Care for life-threatening emergencies first.
   4. Watch for changes in the victims breathing or consciousness.
e. Checking the victim: Breathing or not.
   1. Check for consciousness by taping and shouting at the victim.
   2. Look, listen, and feel for breathing for 5 seconds.
      A. If not breathing, position the victim on their back, tilt head back, and lift chin.
      B. Re-check for breathing
      C. If still not breathing give two slow breaths and check for pulse and severe bleeding
      D. If still not breathing give one (1) breath every five (5) seconds if there is a pulse
      E. If there is no pulse begin CPR

f. Steps in CPR. SEE RULE 4.17

g. Always call 9-1-1 or EMS (Emergency Medical Services) if the victim:
   1. Is or becomes unconscious.
   2. Has trouble breathing.
   3. Has chest pain or pressure.
   4. Is bleeding severely.
   5. Has pressure or pain in the abdomen.
   6. Is vomiting or passing blood.
   7. Has seizures or severe headache or slurred speech.
   8. Has possible broken bones.

Prompt action must be taken in cases of serious injury or sudden illness while help is being summoned. Give immediate attention to the following first-aid priorities:

a. Affect a prompt rescue if the victim is in imminent danger of further injury. Summon medical help as quickly as possible — even if that means leaving the victim momentarily.

b. Ensure that the victim has an open airway and give mouth-to-mouth or cardiopulmonary resuscitation if necessary.

c. Control severe bleeding.

4.05. Shock

a. Definition Shock is a dangerous reduction of blood flow throughout the body tissues and, if untreated, may lead to collapse, coma, and death. The blood vessels become dilated and do not respond to nervous stimuli. If the state of shock continues over a period of only a few hours, it may be fatal or cause permanent damage to essential organs of the body. Shock is made worse by pain and anxiety.

1. Traumatic Shock: Injury-related shock, commonly called “traumatic shock,” is decidedly different from electrical shock and other special forms of shock.

2. Electrical Shock: The result of contact with electrical current. A victim suffering from electrical shock must be removed from contact with the current. The first aid responder must use extreme caution in this procedure to avoid contact with the electrical current. Breathing and the heartbeat, or both, may cease to function with electrical contact; therefore, mouth to mouth cardiopulmonary resuscitation may be needed. Internal or external injuries may also occur.

b. Symptoms
1. The shock victim’s behavior may range from a feeling of restlessness or agitation to stupor and unconsciousness.

2. The pulse rate will be weak or almost imperceptible; it may retain either a regular or irregular rhythm.

3. Other physical symptoms may be:
   - The face may be pale or ashen.
   - The skin may feel cool and clammy with increased perspiration.
   - Pupils may be dilated or unequal in size and will lack luster.
   - Dizziness, nausea and vomiting may occur.
   - Unconsciousness may develop.
   - Breathing may be shallow or stop.
   - The heart may stop beating.

c. First Aid
   It is vital to the victim the first aid providers prevent or treat shock immediately with the following procedures:

   1. Call for medical assistance (911) as soon as possible.
   2. Maintain an open airway at all times.
   3. Keep victim as comfortable as possible in an inactive position lying on back with legs slightly raised (unless leg or back injury is suspected).
   4. Cover or uncover victim using clothing or blankets to maintain normal body temperature.
   5. Do not give liquids or food.
   6. Place victim on the side if nausea occurs to prevent choking on vomit.
   7. Do not move victim unless absolutely necessary.
   8. Avoid rough handling if victim must be moved.
   9. Do not let victim see the injuries, if possible.
   10. Do not discuss the extent of injuries with victim.

4.06. Wounds

A Definition
A wound is a break in the body tissue, either internal or external. Open Wounds: A break in the skin. In all cases the rescuer must take precautions from blood borne pathogens.

There are six types of open wounds.

1. Abrasion: This occurs when scraping damages the outer layers of the protective skin. There is limited bleeding, thus allowing foreign material to remain in the wound.

2. Incision: A clean cut by a sharp object. The bleeding may be rapid and heavy, cleansing the wound of foreign matter. Incisions are usually deep and may cause damage to muscles, tendons, nerves, and blood vessels.

3. Laceration: A lacerated wound is a jagged or irregular cut, characterized by a breaking or tearing of the soft tissues. Bleeding may be rapid and extensive with destruction of the body tissues due to the tearing action.

4. Puncture: an object piercing the skin, creating a hole in the tissue, produces a puncture wound. External bleeding is quite limited with minor punctures; however, bleeding may be moderate to severe with large puncture wounds. Infection may develop easily, with the possibility of tetanus.

5. Avulsion: An avulsed wound results when tissue is forcibly separated or torn from the victim’s body. An avulsed wound if completely removed is also termed an amputation. An incised or lacerated wound, or both, will usually occur
when a body part is avulsed. There will be heavy and rapid bleeding. Any time this situation occurs, the avulsed body part should be sent along with the victim to the hospital. Wrap avulsed part in a cool moist dressing. Do not freeze.

6. Impaled Objects: Do not remove object from wound. If object protrudes from wound, bandage in place to prevent movement of object.

   **NOTE:** Do not place patient on injured side.

2. Closed Wounds: Damage to underlying tissues without a break in the skin. Examples of these wounds are:
   - Contusions: bruises, black eyes, etc.
   - Internal Hemorrhaging: Not readily evident in most cases. May involve damage to internal organs due to puncture wounds, impaled objects, or a traumatic impact.
   - Chest Wounds: An open or closed injury to the chest.

   A. If a surface wound, stop bleeding with a snug pressure dressing.

   B. If the wound extends into the chest cavity, cover hole with an airtight dressing, such as plastic wrap or aluminum foil.

   C. Place the victim with the injured side lower to assist breathing.

   **CAUTION:** Do not tightly bind the chest, since this may hamper breathing. If patient is conscious, assist in finding the most comfortable position in breathing.

b. Symptoms

   Bleeding: There are three types of bleeding the first aid responder will encounter. They are arterial, venous, and capillary.

   1. Arterial: Bleeding from a cut artery occurs in spurts. The blood is bright red in color.

   2. Venous: Bleeding from a cut vein can be recognized by the dark red color of the blood and the manner in which it wells or flows evenly from the wound.

   3. Capillary: Capillary bleeding is the oozing of red blood, generally from an abraded surface. It may be severe, but can be readily controlled.

c. First Aid

   Minor Wounds: All minor wounds not requiring medical attention should be treated as follows but the rescuer shall not have direct contact skin to skin contact with the victim.

   1. Cleanse wound thoroughly with soap and water (use antibacterial soap if available, avoid using detergent soap).

   2. Apply antibiotic ointment.

   3. Place bandage or dressing over the wound.

   4. Observe wound for signs of infection. If redness develops, seek medical assistance.

d. Major Wounds: There are four methods used in the control of bleeding and should be used in the following order if possible: direct pressure, elevation, and pressure point and tourniquet. The tourniquet is seldom used and only as a last resort.

   1. Direct Pressure: Place a sterile compress directly over the wound and apply pressure. In an emergency, pieces of clothing, rags, or gloved fingers may be used. This method is the only available method to control bleeding on the head, face, and torso.
2. Elevation: Where direct pressure is used on extremities, control of bleeding can be helped by elevating the limb. Do not elevate if limb is fractured or if victim has head, chest, or neck injuries.

3. Pressure Points: There are two locations on the body to use as digital pressure points:
   — Brachial artery—located on the inner side of the upper arm along the bone;
   — Femoral artery—located in the groin area. Use heel of hand to apply pressure.

   a. Tourniquet: Rarely used and its use is the risk of sacrificing a limb to save a life. A tourniquet may be applied to the arms or legs only. A tourniquet should be applied only when direct pressure on the wound, elevation of the limb, and pressure on the appropriate pressure point fails to stop the bleeding. Releasing the tourniquet increases the danger of shock, blood clots, and bleeding. Once the tourniquet has been applied, it should not be released except on the advice of a physician.

   A. Use a strip of cloth at least two inches wide, such as a folded triangular bandage. Do not use narrow materials such as rope or wire as these may damage the flesh.

   B. Wrap the cloth or bandage tightly twice around the limb close to the wound, between the wound and the heart.
   C. Tie one overhand knot in the bandage. Place a short, strong stick on top of the knot, then tie two overhand knots on top of the stick.

   D. Twist the stick to tighten a strip of cloth around the limb, until the bleeding is greatly reduced or stops. Wrap and tie in place another strip of cloth around the stick and limb so the tourniquet will not unwind.

   E. Do not cover the tourniquet.

   F. Attach a highly visible note on the victim indicating the location of the tourniquet and the time when applied. Place the note on the victim’s clothing by the collar.

Dangers

1. Shock: When moderate to severe bleeding is present, first aid for shock should be started as soon as possible (see Rule 4.04).

1. Infection: Infection of a wound is characterized by tenderness, redness, warmth, swelling in some cases, and pus appearing on the wound. If infection develops, seek medical attention immediately.

4.07 Blood Bourne Pathogens

Any employee exposed to Bloodbourne pathogens as defined in section 4.03 through the performance of first aid and CPR will be required to be trained in the hazards and proper control of such hazards associated with bloodbourne pathogens

4.08. Fractures

a. Definition

A fracture is a broken bone. There are two types of fractures common to first aid responders: simple and compound.

1. Simple Fracture: In a simple fracture, the bone is broken but the skin is not broken. This fracture may not be obvious to the first aid responder, but the cause of the injury can be used as a guide. Simple fractures are most common and may be
difficult to determine without the assistance of X-ray. If there is doubt, carry out first aid measures for a fracture to prevent aggravation of the injury.

2. Compound Fracture: In a compound fracture, the bone is broken and there is also a connecting wound usually caused by the bone breaking through the skin. Compound fractures carry an added danger of increased bleeding, infection and torn tissue. A fracture may be considered compound without an exposed bone. When an object strikes the skin surface and creates a wound if it is suspected that the underlying bone is broken, the fracture is compound.

b. Symptoms
Information provided by the victim can provide clues to possible fracture locations, such as hearing or feeling the bone break.

1. General symptoms for a simple fracture are:
A. Pain and tenderness in the area of the break.
B. Swelling and discoloration in the area of the break.
C. Deformity of the area.
D. Difficulty moving adjacent joints.

2. General symptoms for a compound fracture are the same as a simple fracture except there may be bleeding and bone protrusion.

b. Fractures of the neck, back, and ribs can be very serious if not treated properly. Extreme care must be given a victim with neck, back, or rib injuries.

c. If you suspect neck or back fractures, do not move the victim, unless their life would be in danger otherwise. Fractures of the neck vertebrae should be suspected if the victim has difficulty in feeling or moving either arms or legs.

c. First Aid

1. First aid for simple and compound fractures is:
A. Do not attempt to reduce or set a fracture.
B. Keep the victim lying down and treat for shock.
C. Maintain an open airway at all times.
D. Protect the victim from further injury.
E. Do not move the victim unless there is danger of further injury.
F. Control bleeding in an open fracture before further measures are performed. If bleeding is profuse, direct pressure should not be applied over the protruding bone. Use pressure points when necessary (see Rule 804 c 3 wounds)
G. In an open fracture, cover the wound area with a large, sterile bandage to reduce chance of infection.
H. Splints are devices applied to the arm, leg, or trunk to immobilize the injured part when a fracture is suspected. Splints should not be used if medical help is readily available. The splint, when used, should be long enough to extend past the joints adjacent to the fracture. Hands and feet should be exposed so the first aid responder can determine whether the splint is too tight by checking for adequate circulation. Splints can be held in place by strips of cloth torn from clothing or other items such as handkerchiefs, neckties, triangular bandages, etc. Secure the ties to the splint firmly so there is no movement but be careful not to turn the splint into a tourniquet. Pad the splint for the comfort of the victim.

2. First aid for fractures of the neck and back:
A. Do not attempt to move or transport a victim with neck or back injuries without the assistance of medical help.
B. Leave the victim lying down and immobilize the neck and back area to avoid any movement. Place a rolled blanket, sand, dirt, or gravel in bags or material around the neck, head, and body of the victim to ensure complete immobilization.
3. First aid for fractures of the rib cage.

Fractures of the rib cage can be quite painful. Unnecessary handling of the broken rib could cause a fractured rib to be driven into a lung, causing the lung to collapse. If the victim has difficulty in breathing, gently place him/her in a semi-prone position which should relieve some discomfort. When blood or fluids are draining from the victim’s mouth, place the victim on the side to prevent inhalation of the fluids. Place the victim with the injured side lower to assist breathing.

4. Fractures are very painful and it is the first aider’s duty to make the victim as comfortable as possible with a minimum of movement, protecting the victim from further injury, and getting medical help as soon as possible.

4.09. Burns

Definition:

a. A burn is an injury to cells and body tissue resulting from contact with heat, hot objects, hot solutions or vapors, chemicals, radiation, and electricity. A burn may vary in depth, degree, and severity. In general, a victim suffering burns to 15% of the body surface requires hospitalization. There are three classifications of burns.

b. Symptoms by Classification
Usually, all burns involve moderate to severe pain. The symptoms for shock may be present. Specific symptoms for the degree of a burn are as follows:

1. First Degree:
   A. Mild to moderate pain.
   B. Redness or discoloration.
   C. Mild swelling.
   D. Skin warm to touch.
   E. Rapid healing and little, if any, scarring.
2. Second Degree:
   A. Moderate to severe pain.
   B. Deeper tissue destruction than first degree.
   C. Red or mottled appearance of tissue.
   D. Development of blisters and swelling over a period of several days.
   E. Wet appearance on the surface of the burned tissue.
3. Third Degree:
   A. Severe pain.
   B. Deep destruction of body tissue and nerve endings.
   C. White or charred appearance of the burned tissue.
   D. Complete loss of all layers of skin.

c. First Aid
The objective of the first aid responder attending a burn victim is to relieve pain, prevent infection, and treat for shock immediately.

1. Minor Burns — When medical attention is not necessary:

   A. Immediately immerse burned area for short periods in cold water until pain subsides.
   B. If immersion in cold water is not possible, apply thick cold packs over the burned area. Water Jel or Burn-Jel can be used to decrease pain.
   C. When the pain has subsided, blot the area dry and bandage with sterile gauze dressing lightly in place. Do not puncture any blisters yourself.

2. Major Burns — Includes extensive minor burns:
A. Cool the burned area with lukewarm to cool water. Apply Water-Jel Burn Dressing or Water-Jel Burn Free if available. Only cool until the skin is back to normal temperature. Cover the burned area with a thick sterile dressing moistened with saline or cool water.

B. Cold packs or immersion in cold water should be limited to small, severely burned areas such as the face, hands, or feet. The cold may intensify the shock reaction if applied over a large, severely burned area.

C. Cut away clothing and remove jewelry to reduce problems caused by swelling. Do not attempt to remove clothing that sticks to the burns; cut around such clothing.

D. Do not apply grease or ointment to any burn.

3. Chemical Burns:

A. Flush the burned area thoroughly with water for at least 10–15 minutes.
B. Remove any clothing which was exposed to the chemical and continue flushing area.
C. Do not apply Water-Jel Burn Dressing, Water Jel, Burn Jel or Burn Free to any chemical burn.
D. Eyes should be thoroughly flushed with water, taking care to flush from the nose outward, cover eyes with a dry, sterile, protective dressing and bandage in place. Do not use any type of cotton as a dressing for the eyes. Bandage both eyes.

Dangers
Shock may be present with any burn. Use sterile packs and dressings whenever possible to prevent infection. Water-Jel Burn Dressing is a sterile dressing. It can be used safely to protect all burns. Water Jel Burn Jel is a medicated product designed to decrease pain and is appropriate only for the treatment of minor burns.

4.10. Heat Illness

a. Definition

1. Heat Illness means a serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, heat syncope and heat stroke.

2. Acclimatization means temporary adaptation of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat.

b. Training shall be provided to all supervisory and non-supervisory employees regarding the different types of heat illness, the common signs and symptoms of heat illness and the importance of acclimatization.

c. Provision of water. Employees shall have access to potable drinking water in sufficient quantity at the beginning of the work shift to provide one quart per employee per hour for drinking for the entire shift. It is permissible to begin the shift with smaller quantities of water if effective procedures are established for replenishment of potable water during the shift as needed to allow employees to drink one quart or more per hour. The frequent drinking of water shall be encouraged.

d. “Temperature” means the dry bulb temperature in degrees Fahrenheit obtainable by using a thermometer to measure the outdoor temperature in an area where there is no shade. While the temperature measurement must be taken in an area with full sunlight, the bulb or sensor of the thermometer should be shielded while taking the measurement, e.g., with the hand or some other object, from direct contact by sunlight.

e. Access to shade.

(1) Shade required to be present when the temperature exceeds 85 degrees Fahrenheit. When the outdoor temperature in the work area exceeds 85 degrees Fahrenheit, the employer shall have and maintain one or more areas with shade at all times while employees are present that are either open to the air or provided with ventilation or cooling. The amount of shade present shall be at least enough to accommodate 25% of the employees on the shift at any time, so that they can sit in a normal posture fully in the shade without having to be in physical contact with each other. The shaded area shall be located as close as practicable to the areas where employees are working.
(2) Shade required to be available when the temperature does not exceed 85 degrees Fahrenheit. When the outdoor temperature in the work area does not exceed 85 degrees Fahrenheit employers shall either provide shade as per subsection (d)(1) or provide timely access to shade upon an employee's request.

(3) Employees shall be allowed and encouraged to take a cool-down rest in the shade for a period of no less than five minutes at a time when they feel the need to do so to protect themselves from overheating. Such access to shade shall be permitted at all times.

Exceptions to subsection (d):

(1) Where it is infeasible or unsafe to have a shade structure, or otherwise to have shade present on a continuous basis, the supervisor may utilize alternative procedures for providing access to shade if the alternative procedures provide equivalent protection.

(e) High-heat procedures. High-heat procedures shall be implemented when the temperature equals or exceeds 95 degrees Fahrenheit. These procedures shall include the following to the extent practicable:

(1) Ensuring effective communication by voice, observation, or electronic means is maintained so employees at the work site can contact a supervisor when necessary. An electronic device, such as a cell phone or text messaging device, may be used for this purpose only if reception in the area is reliable.

(2) Observing employees for alertness and signs or symptoms of heat illness.

(3) Reminding employees throughout the work shift to drink plenty of water.

(4) Close supervision of a new employee by a supervisor or designee for the first 14 days of the employee's employment by the employer, unless the employee indicates at the time of hire that he or she has been doing similar outdoor work for at least 10 of the past 30 days for 4 or more hours per day

4.11 Heatstroke

a. Definition
Heatstroke is a response to heat, characterized by extremely high body temperature. This condition is a life-threatening emergency for which first aid is urgently needed.

b. Symptoms
1. There are four primary symptoms:
   A. Hot, dry skin.
   B. Flushed or red face.
   C. Fast, throbbing pulse.
   D. Extremely high temperature of 106 degrees or higher.

2. Other symptoms are:
   A. Headache.
   B. Dizziness and nausea.
   C. Unconsciousness in severe cases.

c. First Aid
Immediate measures should be taken to reduce the body temperature. Temperature reduction should be done quickly, taking care to prevent chilling.
1. Call for medical assistance (911) as soon as possible.
2. Move victim to a cool, shaded area. If they start to shiver or say they are cold, cover the victim to maintain normal body temperature.
4. Apply ice packs or cold packs to the forehead, wrists, under the arms, and behind the neck and knees. Do not immerse victim in ice water. If ice packs or cold packs are not available, dampen the victim with cool or tepid water.
5. Do not give liquids to the unconscious or semiconscious victim. When the temperature goes down, and the victim feels better, liquids can be given in gradual amounts, a sip at a time.

d. Prevention

The following precautions should be taken when working or playing in extreme heat:

1. Gradually adjust the body to the climate, especially when sunbathing.
2. Wear proper clothing, such as long pants, a T-shirt, a long-sleeved shirt, and a hat (these provide shading for the skin).
3. Eat lighter meals and drink more fluids even if you are not thirsty.

4.12. Heat Exhaustion

a. Definition
Heat exhaustion is the result of overexposure to excessive heat over a prolonged period of time. It is a response to heat characterized by fatigue, muscle weakness and collapse.

b. Symptoms

1. The primary symptoms are the same as in shock:
   A. Pale face.
   B. Cool, clammy skin.
   C. Rapid, but weak, pulse, regular or irregular rhythm.
   D. Profuse perspiration.

2. Other symptoms are:
   A. A normal or slightly lowered temperature.
   B. Dizziness and nausea.
   C. Unconsciousness in severe cases.

c. First Aid

Care for heat exhaustion is similar to first aid for shock.

1. Move the victim, if necessary, to a cool area with shade and circulating air.
2. Keep the victim lying down with the head level with the body, and loosen tight clothing to allow for better circulation and breathing.
3. Maintain normal body temperature. **Do not overheat the victim.**
4. If conscious, give water to replace lost fluids.
5. If recovery is not prompt, seek medical attention.

d. Prevention

1. Gradually adjust the body to the climate.
2. Wear proper clothing when working or playing.
3. Eat lighter meals, drink more fluids, and add extra salt to the diet. Check with your doctor before using more salt since it could complicate some medical problems, like high blood pressure.

**4.13. Heat Cramps**

a. Definition

Heat cramps are an imbalance of salt and water in the body due to improper perspiration.

b. Symptoms

1. Muscle cramping in legs or abdomen due to the salt loss.

c. First Aid

1. Have victim rest. Move victim to a cool, shaded area.
2. Massage the muscles gently to help relieve the spasm.
3. Drink water to help balance sodium.
4. If problem persists, seek medical aid.

**4.14. Sprains**

a. Description

In a sprain, the tendons or ligaments that bind bones together at the joint are stretched beyond their limits. In some cases, the ligament, joint capsule, muscles, tendons, and blood vessels may be ruptured, depending on the extent of the injury. The tearing of blood vessels causes blood to escape into the surrounding area and is responsible for the visible bruising. A sprain may be as serious as a simple fracture.

b. Symptoms

1. Swelling can occur rapidly.
2. Pain, especially on motion.
3. Discoloration develops as blood collects in the joint.
4. Tenderness to the touch.

c. First Aid

First aid care is limited to keeping the injured part immobile. To reduce swelling, keep the injured part elevated above the level of the heart and apply ice packs to the injured area for the first 24 to 48 hours. Reduce swelling by applying an ace wrap, sling/splint, or binding to the injured part.

d. Dangers

In some cases, a sprain is accompanied by a simple fracture and medical attention should be sought.

**4.15. Dislocations**

a. Description
When a bone is dislocated, it is moved partially or completely out of its normal joint position. A dislocation occurs when the bones are in a position in which muscle support is at a minimum. No joint is immune from dislocation. If the dislocation cuts off blood supply, a major orthopedic emergency can take place.

b. Symptoms

1. Severe pain, especially upon movement of the joint.
2. Deformity of joint area, slight to severe.
3. Rapid swelling.

c. First Aid

Only a physician should attempt to treat the dislocated joint.

1. Seek medical attention immediately.
2. Keep victim lying down or in a semi-reclined position.
3. Apply cold packs to the injured joint to reduce swelling.
4. Immobilize the injured extremity by applying a sling, a splint, or binding to the body.
5. Finger and toe dislocations may be treated by the first aid responder. This can be accomplished by exerting pressure outward, very slowly, until the joints fall into its normal position.

4.16 Head Injuries

a. Definition

Head injuries may be classified according to the structure involved. Skull fractures are injuries to the bone structure, and concussions are injuries to the brain and its covering. The scalp may be cut, or great areas of it may be torn away. Within the skull, either the coverings of the brain and/or the brain itself may be damaged.

b. Symptoms

The easiest symptoms to observe, if there are no overt signs, are the eyes. One or both pupils may be dilated. The right side of the brain controls the left side of the body and vice versa. If both pupils are dilated, there may be a severe head injury present, usually at the base of the skull. Other symptoms include:

1. A period of unconsciousness.
2. Lacerations which may result in profuse bleeding.
3. Bleeding from the nose and ears.
4. Dripping of clear fluid from the nose and ears. The rupture of a thin membrane called the dura mater causes this. This symptom denotes a very serious head injury.
5. The face may be pale or flush (red).
6. Headache, dizziness, nausea, and vomiting or excessive fatigue may be present.
7. Disturbance of speech, difficulty in breathing and/or coordination.

c. First Aid

It is necessary to protect the head from further movement and injury. Keep head elevated if possible.

1. Do not stop bleeding from nose or ears.
2. Control extensive bleeding from scalp if present. Do not use excessive pressure.
4. Monitor airway, breathing, and circulation.
d. Dangers

Never minimize the severity of head injuries. Complications may occur sometime after the original injury. A person suffering a head injury should be monitored for at least five to six hours after the injury. Any deviation from normal behavior, such as speech difficulties, increased tiredness, double or blurred vision, recurrent dizziness and nausea, lack of coordination, and a physician should check memory loss.

4.17. Eye Injuries

a. Definition

Foreign objects are often blown or rubbed into the eyes. These objects may scratch the surface of the eye or become embedded in the eye. Injuries may occur to the eyelids. Contusions can involve tissue around the eye, and in serious cases, the structure of the eye may be torn or ruptured. Penetrating injuries of the eye are extremely serious and can result in blindness.

b. Symptoms

• Red and irritated eyes.
• Burning sensation.
• Pain, which may be quite severe.
• Excessive tear production.
• Headache.

c. First Aid

First aid for eye injuries is minimal due to the sensitivity of the organ. Keep the victim from rubbing the eye. Do not attempt to remove a foreign object from the eye.

1. Presence of a foreign object:

• Seek medical attention immediately.
• Flushing the eye thoroughly with water to remove objects.
• If the object is still not removed, it may be embedded in the eye. Put a raised object, such as a cup, over the injured eye. Apply a clean, sterile dressing over the other eye and bandage both in place. This limits movement of the eye which could cause further damage.

2. Lacerations near the eye:

• Apply direct pressure gently over the wound to control bleeding.
• Apply a sterile dressing and bandage in place.
• Seek medical attention. Further damage from hemorrhage or infection may occur.

3. Contusions around the eye:

• Apply cold packs to reduce swelling.
• Apply a clean or sterile dressing and bandage in place.

4. Penetrating injuries of the eye:

• Do not attempt to remove or wash out the object.
• Apply a raised object such as a plastic cup over the injured eye, and a clean or sterile dressing over both eyes, to reduce movement. Bandage loosely to avoid any pressure on the injured eye.

d. Seek medical attention immediately. This is an extremely serious injury and blindness could result.

e. Dangers

All eye injuries can be very serious. After first aid care is applied, the victim should seek medical attention.
4.18. Mouth-to-Mouth Resuscitation

a. Introduction

Rescuer should always personally perform CPR/or Rescue Breathing, as required, unless the rescuer becomes too fatigued to continue. In such circumstances, the help of others may be utilized under the rescuer's supervision. Whenever possible, CPR and/or Rescue Breathing should be done uniformly and without interruption pending arrival of EMS. Every effort should be made to keep any unavoidable interruption in resuscitation to not more than five (5) seconds. If the patient is turned over to others for the giving of resuscitation, the rescuer should supervise the procedures to insure that they are carried out properly.

b. Symptoms — Respiratory Arrest

1. The victim's color may be abnormal, such as: pale, ashen, bluish in appearance or, in the case of carbon monoxide poisoning, cherry red (this is a rare late sign. This coloration usually develops after death).
2. No rise or fall of the chest cavity.
3. The victim's body muscles may be relaxed or rigid.

c. Rescue Breathing Resuscitation

1. Call 911 immediately.
2. Perform Mouth-to-mouth resuscitation as follows:
   1. Opening the airway: Put one hand under the victim’s chin and the other hand on the victim’s forehead. Gently pull the chin away from the back of the throat without closing the mouth. When this is done, the jaw and tongue are drawn forward and the air passage is cleared.
   2. With the heel of your hand resting on the victim’s forehead, bring your thumb and forefinger across to pinch the nose. Pinch the nose and breathe into the victim’s mouth or nose. Pinching the nose will prevent the rescuer’s air from escaping.
   3. After opening the airway and pinching the nose, you are now ready to breathe into the victim’s mouth. Remember, you are breathing for two people, so take a deeper breath than normal. Open your mouth wide enough to encircle the victim’s mouth. Air is blown into the victim’s lungs until the chest expands visibly. Remove your mouth and take another breath of air while you see or feel the victim exhale.
3. Each inhalation and exhalation is termed a cycle. The rhythm is 12 cycles per minute. Every five seconds, you should give the victim one breath of air. Count 1001, 1002, 1003, 1004, breathe.

d. If the victim’s mouth cannot be opened, use the mouth-to-nose technique.

   • Seal the victim’s lips with your thumb so no air can escape.
   • Take an even deeper breath and blow into the victim’s nose.
   • After approximately five to ten breaths, the victim’s muscles may relax. If so, begin mouth-to-mouth which is the more desirable method of resuscitation.

e. Dangers

   • If the stomach balloons or expands, air is not being delivered to the lungs. The cause of this is often the speed with which the rescuer’s breath was forced into the lungs. Take a full 1 to 2 seconds for each breath. Release the air by applying gentle pressure with the heel of your hand on the stomach during the exhalation stage.
• After the victim has recovered, they should be placed on their side in case they become ill and vomit. If they were to remain on their back, they could choke on vomitus matter. Clear vomitus from mouth and maintain open airway.

4.19. Cardiopulmonary Resuscitation (CPR)

a. Description

CPR is a combination of rescue breathing resuscitation and chest compression. It is used when a victim is not breathing and they have no detectable heartbeat. The emphasis of CPR is on the application of the A, B, and C’s:

A — Open Airway
B — Restore Breathing
C — Restore Circulation.

In an adult, the heart beats between 60 and 100 times a minute and if, for any reason, the heartbeat stops, death occurs. To save a life, you must know beforehand how to treat the victim.

b. Symptoms- If someone has experienced cardiac arrest, the first aid provider will not be able to detect a pulse. If you come upon someone unconscious:

• First, check to see if the victim is breathing. If they are not, install mouth barrier if available then use mouth to mouth resuscitation to give the victim 2 breaths.
• Next, place your second and third fingertips on the carotid artery located near the Adams Apple in the neck region. Check the pulse on both sides of the Adams Apple. No pulse means probable cardiac arrest. Chances of recovery decrease with every passing minute. Every critical second counts when a life hangs in balance.

c. Cardiopulmonary Resuscitation — Technique for Adult Victim

• Call 911 immediately.
• To compress the heart, pressure is applied manually to the breastbone. The rescuer is compressing the heart between the sternum and backbone. The rescuer must move the chest cavity an inch and a half to two inches to be effective. The positioning of the hands on the sternum is very important. First, locate the lower half of the sternum. If you’re not quite certain which is the lower half, run the fingers of the hand nearest the victim’s feet along the bottom of the rib cage and find where the rib cage meets the breast bone.
• Once your fingers detect the spot where the breastbone meets the rib cage, place the heel of the hand nearest the victim’s head on the breastbone.
• The heel of your hand should be on the lower half of the sternum, not the soft fleshy area.
• The second hand is then placed on top of the first hand. Entwine fingers to keep them off the ribs.
• With your shoulders directly over the victim’s chest, and your hands in the proper position, lock elbows, keeping your arms straight. If you bend your elbows, you will tire more easily.
• The heart is compressed against the sternum and spine, forcing the blood out. Relaxation of pressure allows the heart to fill again. The victim must be on a firm flat surface. If the victim is on a soft surface such as a bed, the compressions will be ineffective. A solo first aid responder will perform CPR by doing both mouth-to-mouth and cardiopulmonary resuscitation. Begin by inflating the victim’s lungs two times and begin the compressions on the sternum. The rescuer does 15 compressions on the sternum, then leans down and gives the victim two breaths of air. After four cycles of 15 chest compressions and 2 breaths (this should take about one minute), the rescuer should recheck the carotid artery to determine if the heart is beating. If the heart beat has resumed, CPR can be stopped and the victim checked for other problems (such as respiratory arrest). Otherwise continue CPR until medical help arrives or you become exhausted.
d. Dangers and Precautions

- If breathing or heartbeat stop, the brain, which is the most sensitive tissue of the body, may be seriously damaged or death may occur. CPR must be started within four to six minutes after breathing and heartbeat stop.
- Do not place your hands flat on the victim’s chest. Damage may occur to the ribs and pressure will not be applied where it is needed. Keep fingers off chest.
- Be sure that your hands are on the lower half of the sternum and not on the fleshly area. Use heel of hand only for compressions.

4.20. Transfer

a. Definition

Emergency rescue and transfer deal with the movement of victims away from hazardous locations and the use of protective methods to support a victim’s body during emergency transfer.

b. Objectives

Emergency rescue and transfer is limited to situations in which professional help is not available or if there is an immediate danger of further injury to the victim. At all other times, the victim should be left where found. If a person becomes ill or injured to the extent that will require transporting to a medical facility, the first decision to be made by the first aid provider is whether it is necessary for the victim to be relocated. If it is not necessary to immediately extract the victim from a serious hazard, they should not be relocated until such life-threatening problems as respiratory or cardiac arrests are cared for. It should be recognized that more harm can be done through improper rescue and transfer than through any other measure associated with first aid. In most situations, ambulance or rescue personnel should carry out rescue from confinement. Pending their arrival, the first aid provider should gain access to the victim, give emergency care, reassure, and avoid ill-advised or foolhardy attempts at rescue that might jeopardize the safety of the victim as well as that of the first aid provider. If victims must be pulled or dragged to safety, they should be pulled in the direction of the long axis of the body. They should never be lifted by the head, pulled upward by the belt, or pulled sideways. The victim’s entire body should be kept in a straight line and moved as a unit, when possible. Emergency transfer can be accomplished by one of two methods:

1. Shoulder Drag: Grasp the victim under the arms; bring your arms together so that the victim’s head is resting on the inside of your arms. Then pull the victim to safety in a steady motion.

2. Ankle Drag: Grasp the victim by the ankles and pull to safety, avoiding, whenever possible, jerking and jarring motions. Prior to handling or transporting, observe the victim to determine the extent of injuries. Leave the victim in the position found, if at all possible. If conscious, ask if they will be more comfortable in a different position, providing it does not cause further injury. Remember, improper handling of an injured person may cause additional injury or aggravation of the existing injury.

4.21. Sudden Illness

First aid providers often encounter situations that are not related to injury, but arise from either sudden illness or worsening of a chronic illness. Many persons suffering from heart disease, stroke, epilepsy, or diabetes carry an identification card or bracelet that contains information about the type of illness and the steps to be followed if they are found unconscious. Search the victim for such identification once breathing and heartbeat are restored.

a. Heart Attack
Heart attack often involves a clot in one of the blood vessels that supply the heart. The attack is sometimes called a coronary since there is a loss of blood supply to a portion of the heart muscle. A heart attack may or may not be accompanied by a loss of consciousness. If the attack is severe, the victim may die suddenly. The victim may have a history of heart disease or the attack may come with little or no warning. The pain or pressure that accompanies a heart attack can range from mild to severe. The degree of pain is not a good indication of the seriousness of the attack.

1. Symptoms

- Persistent chest pain or pressure lasting two minutes or longer, usually under the sternum. The pain frequently radiates to one or both shoulders or the arm. The pain can also radiate to the back, neck, jaws, and teeth. Some patients have pain only in the jaw or teeth.
- Gasping or shortness of breath.
- Extreme pallor or bluish discoloration of the lips, skin, and fingernail beds.
- Extreme fatigue.
- Clamminess.
- Unconsciousness.

3. First Aid

- If conscious, have someone call 911.
- Place the victim in a comfortable position. This is usually a sitting position leaning back at a 45 degree angle. This position will allow the victim to breathe easier.
- Give mouth to mouth resuscitation and cardiopulmonary resuscitation if the victim is not breathing. (See Rule 814 and 815)
- If the victim has nitroglycerin, help them take it.
- Do not give any liquids or food.
- Do not transport the victim without medical advice.

b. Stroke

A stroke usually involves a spontaneous rupture of a blood vessel in the brain or a formation of a clot that interferes with circulation. In a major stroke, a large blood vessel to the brain is involved.

Symptoms of stroke:

- Unconsciousness.
- Paralysis or weakness on one side of the body.
- Difficulty in breathing, swallowing, or speaking.
- Loss of bladder or bowel control.
- Pupils may be unequal in size.
- Headache — severe or mild.

First aid for a major stroke:

- Call 911 as soon as possible.
- Provide moderate covering, treat for shock. Reassure victim.
- Maintain an open airway.
- Give mouth to mouth or cardiopulmonary resuscitation if needed. (See Rule 4.15 and 4.16)
- Place the victim on the affected side so that secretions will drain from the mouth.
- Do not give any liquids or food.
- Maintain victim’s dignity.
• Remember that the victim can usually hear and understand what you are saying, even if they are having trouble talking to you.

c. Fainting

Fainting is a partial or complete loss of consciousness due to a reduced blood supply to the brain for a short period of time. The victim collapses suddenly, without warning. Recovery of consciousness almost always occurs quickly. However, injury may occur from the fall. To prevent a fainting attack, a person who feels weak or dizzy should lie down or bend over with the head at knee level. If a person bends over to put their head at the knee level, make sure there is support so they do not fall off a chair and cause further injury.

Symptoms

• Extreme paleness.
• Cool, clammy skin.
• Dizziness and nausea.
• Numbness and tingling of the hands and feet.
• Possible disturbance of vision.

First Aid

• Help the victim lie down.
• Maintain an open airway.
• Loosen any tight clothing and provide adequate ventilation.
• If the victim is nauseous, roll the victim as a unit onto their side to prevent aspiration of the vomit if it should occur.
• Do not pour water over the victim’s face. Bathe the face gently with cool damp cloths and treat for shock.
• Do not give any liquids until the victim has completely revived.
• Examine the victim for injuries suffered if they have fallen.
• Unless recovery is prompt, seek further medical assistance.

d. Seizures

If the normal functions of the brain are interrupted by disease, infections, or injuries, the electrical activities of the brain can malfunction. The malfunction can cause seizures by bringing on sudden changes in sensation, behavior, or movement. Seizures are not a disease, but a sign of an underlying disease. Epilepsy is the best known condition that causes seizures. Epilepsy is only one of many conditions that may cause seizures. Some other causes of seizures include brain tumors, birth defects, high fevers, poisons, trauma, and infections.

Symptoms

• Rigidity of body muscles, usually lasting from a few seconds to perhaps half a minute, followed by violent jerking movements.
• The victim may stop breathing, and bite the tongue.
• The victim may lose bladder and bowel control.
• The victim may foam at the mouth or have heavy drooling.
• Mild seizures may appear as staring spells or repetitive purposeless behavior.

First Aid
• Do not force anything into the mouth.
• Protect the victim’s head by placing something soft under it.
• Do not restrain the patient.
• Reassure the patient (they may still hear you).
• Allow the patient to rest after the seizure is over.
• Following the seizure, you may turn the victim on their side to allow fluids to drain from the mouth.
• Call 911, if the patient:
  • Is injured during seizure.
  • Has no history of seizures.
  • Does not resume breathing following the seizure.
  • Has a continuous seizure without regaining consciousness.
  • If victim requests emergency care.

4.22. Snake Bites

a. Definition

The rattlesnake is the only poisonous snake found in our work territory. It is important to be able to identify the snake if a bite occurs. Victims have been known to go to great extremes for treatment when the snake was not even poisonous.

b. Symptoms

All reactions from snakebites are aggravated by acute fear and anxiety. Rattlesnake bites show the following symptoms:

• Extreme pain at bite location (with the exception of the Mojave Rattlesnake).
• One or more puncture wounds from the fangs.
• Rapid swelling.
• Discoloration of the skin.
• General weakness, numbness or tingling.
• Rapid pulse and shortness of breath.
• Nausea and vomiting.
• Blurred vision.
• Shock.

c. First Aid

Immediate care is absolutely necessary.

• Call 911 to secure transportation to the nearest hospital as soon as possible.
• Keep the victim lying down and immobilized, if possible. Remove any constricting jewelry such as rings, bracelets to reduce complications that could arise if rapid swelling occurs.
• It is not recommended that cold compresses, ice, dry ice, chemical ice packs, spray refrigerants, or any other methods of cold therapy be used in the first aid treatment of Rattlesnake bites.
• Apply an antiseptic over the fang marks and around the general area of the bite.
• Do not give any liquids.
• Treat the victim for shock. If possible, keep the bitten area lower than the heart.
• If the victim can be transported to the hospital in less than 30 minutes, comfort the victim until the arrival of trained personnel.
• Apply a constricting band, not a tourniquet, about two to four inches above the fang marks, between the puncture wounds and the heart. The constricting band should be just tight enough to stop the flow of surface fluids, but should not restrict the flow of blood in the deeper blood vessels.
• Secure medical treatment and transportation to the nearest hospital as soon as possible. If you must transport the victim, be sure the victim is transported with the bitten area immobilized. Keep the victim in a comfortable position, lying on his/her back if possible.

4.23. Insect Bites and Stings

a. Definition

Stings from scorpions, ants, bees, wasps, hornets, and yellow jackets may cause severe pain and localized swelling. A more severe reaction is almost always due to acute allergic reaction or multiple stings. Some types of bees are much more aggressive and are likely to give multiple stings, but the first aid is the same. Bites from insects such as fleas, mosquitoes, lice, gnats, chiggers, etc., produce local pain and irritation and may transmit disease to the victim. Some ticks also carry Lyme disease and adhere tenaciously to the skin. Bites of the black widow spider and the brown recluse (or violin) spider can be very painful and serious.

b. Symptoms

- Minor Bites
  - Localized pain.
  - Irritation and swelling.
  - Nausea, vomiting, and other symptoms of shock if there is an allergic reaction.

Black Widow Spider Bites

- Pain and swelling at the site of the bite.
- The pain spreads throughout the body.
- Profuse perspiration.
- Nausea and abdominal cramps.
- Difficulty in breathing and speaking.
- Possible development of convulsions.
- Ringing in the ears and headache.
- Pupils are dilated and reflexes are overactive.

Brown Recluse (Violin) Spider Bites

- Mild, transitory stinging at the time of the bite. Very little early pain, only after two to eight hours. The pain varies from mild to severe.
- After several days, an open ulcer may form at the site of the bite that progressively enlarges.
- Development of chills, fever, joint pains, nausea, and vomiting.
- Possible development of generalized rash within from 24 to 48 hours.

Scorpion Stings

- Excruciating pain where stung with little inflammation or swelling.
- Acute restlessness and drooling of saliva.
- Abdominal muscles become rigid and contraction of arms and legs may occur.
- Temperature may reach 103 to 104 degrees.
- Skin may gradually turn blue and respiration may become difficult.

c. First Aid
Minor Bites

- Immediate application of antibiotic ointment.
- Cold compresses.
- If symptoms increase, secure medical assistance.

Major Bites (Spiders, Scorpions, etc.) and Severe Reaction to Minor Bites

- Give mouth to mouth or cardiopulmonary resuscitation if needed.
- Treat for shock, if necessary.
- Keep affected part down below the level of the victim’s heart.
- Apply an antibiotic ointment to the bite area.
- Apply cold packs to the bite area.
- Seek medical treatment as soon as possible.
- In case of a bee sting, remove the stinger and venom sac, being careful not to break or squeeze the sac. One of the best ways to remove the stinger is to scrape it off using some plastic or stiff paper. Watch where the stinger goes, as it still has the poison in it and can affect others.
- A venom extractor may be used to remove some of the poison from the wound.

4.24. Human and Animal Bites

a. Definition

Injuries produced by any human or animal, wild or domestic, may result in an open wound. Dog and cat bites are common. A dog bite may cause more extensive tissue damage than a cat bite, although the cat bite may be more dangerous because of the wider variety of bacteria that is usually present in the mouth of a cat. Some wild animals, especially bats, raccoons and rats transmit rabies. Rabies can be transmitted when a rabid animal licks an open wound on a human or another animal. Tetanus is an added danger to animal bites. There is a great risk of infection from an animal bite. Human bites can also cause serious infections.

b. First Aid

- A bite on the face or neck requires immediate medical attention.
- Use latex gloves and avoid skin to skin contact.
- Thoroughly wash the wound with soap and water. Apply triple antibiotic ointment and a dressing.
- Obtain a description of the animal and the geographical location where the bite occurred. Keep in contact with any suspected rabid animal so that it can be kept under observation to determine whether or not it develops the final stage of rabies. Do not kill the animal unless absolutely necessary.
- Report the incident to local health authorities and follow their advice.
- When human or animal bites break the skin, the victim must be taken to a physician for appropriate treatment.

4.25. Poison Oak

a. Definition

Western poison oak usually grows in shrub and sometimes vine form. It is found in California and parts of adjacent states. The most distinctive features of poison oak are the leaves, which are composed of three leaflets each. The plants also have greenish-white flowers and berries that grow in clusters. Contact with the oil on the plant causes the allergic reaction associated with poison oak.
b. Symptoms

- Itching with blister formation.
- Redness.
- A rash begins within a few hours after exposure. It may be delayed as long as 10 days.

c. First Aid

- Remove contaminated clothing. Wash all exposed areas thoroughly with soap and water.
- Apply medication as directed to the affected area.
- Seek medical advice if a severe rash occurs.

d. Prevention

- Learn to identify the poisonous plants in locations where you live and work.
- Avoid contact with noxious plants.
- Stay away from plants that are being burned — the smoke may contain active substance.

4.26. Aerial / Poletop Rescue

a. Description

Aerial/Poletop rescue is used whenever a person is incapacitated while in an elevated position. The purpose in rescuing a person is to clear the victim from any imminent danger, administer first aid, and lower the victim to the ground as quickly as possible. The lowering techniques are divided into two separate categories: the lineman’s body belt method and the fast rope tie.

- The Lineman’s Body Belt method can be used when lowering a victim from an elevated position.
- The Fast Rope Tie method should be used only in the event of a cardiac arrest when it becomes necessary to lower the victim to the ground immediately so that CPR can be given while the victim is in a horizontal position; a position that is infeasible to attain while on a pole or structure.
- Rope with a safe workload rating equal to approved 1/2-inch hand line material shall be used when lowering a person from a pole or elevated position.

b. Aerial/Poletop Rescue (Rescue Breathing) In the event it becomes impossible to lower a victim immediately or within a reasonable amount of time (three to four minutes), aerial resuscitation should be started at once.

- Rescue Breathing is to be given only if the victim has a pulse. Position yourself above the victim and over to one side. The victim’s head is tilted back and the mouth is pulled open with one hand.
- The rescuer opens his/her mouth widely and gives the victim approximately one breath every five seconds. This will average out to 10 or 12 breaths per minute.
- If the victim has foreign objects in the throat or their tongue has moved back blocking the airway, clear the airway and resume rescue breathing resuscitation. If the victim has no pulse, immediately lower the victim to the ground.
- After the victim has been lowered to the ground, Rescue Breathing and chest compression should be started and continued until the arrival of an ambulance or other rescue personnel.
4.27. Frostbite

a. Definition

Frostbite results when crystals form, either superficially or deeply in the fluids and underlying soft tissues of the skin. The effects are more severe if the injured area is thawed and then refrozen. Frostbite is the most common injury resulting from exposure to cold elements with the nose, cheeks, ears, fingers, and toes most commonly affected. Frostbite can leave permanent damage to tissues.

b. Symptoms

- Just before frostbite occurs, the affected skin may be slightly flushed. Frostnip is the first stage, fingertips or exposed patches of skin will appear shiny.
- As frostbite develops the skin changes to white or grayish-yellow in appearance.
- Pain is sometimes felt early but subsides later as nerve endings become numb (often there is no pain).
- Blisters may appear later.
- The affected area feels intensely cold and numb.
- The victim frequently is not aware of frostbite until someone tells him/her or he/she observes the pale, glossy skin.

c. First Aid

- The objectives of first aid are to protect the frozen area from further injury, to warm the affected area rapidly, and to maintain respiration.

Procedure

- Cover or bandage the frozen area loosely.
• Provide extra clothing and blankets.
• Bring the victim indoors as soon as possible.
• Give the victim a warm drink if the victim can tolerate it.

**CAUTION:** Rewarming of frozen body parts should be done by medical professionals to prevent further trauma to the victim. If emergency medical assistance is not available, rewarmon the frozen part quickly by immersing it in water that is warm (102°–105°F) but not hot, when tested.

**NOTE:** If the affected part has been thawed and refrozen, it should be warmed at room temperature (70°–74°F).

- If warm water is not available, wrap the affected area gently in a sheet and warm blankets.
- DO NOT rub the area; rubbing may cause gangrene.
- DO NOT apply heat lamps or hot water bottles or allow the victim to bring the affected area near a hot stove.
- DO NOT break the blisters.
- In case of minor exposure only, once the affected area is rewarmed, have the victim exercise it.
- Since severe swelling develops very rapidly after thawing, discontinue warming as soon as the affected area becomes flushed.
- If fingers or toes are involved, place dry, sterile gauze between them to keep them separated.
- Keep injured areas elevated.
- Obtain medical assistance as soon as possible.

**d. Prevention**

- Prevention involves limiting, if not avoiding, the duration of exposure to extreme cold, avoiding personal practices that may actually contribute to freezing of tissue, wearing protective clothing, recognizing early symptoms of the onset of frostbite, and removing yourself from such exposure.

### 4.28. Hypothermia

**a. Definition**

Lower than normal body temperature, due to a cool and wet, or cold environment. Water, wet clothing, and wind accelerate heat loss. This can be a life-threatening condition.

**b. Symptoms**

- Shivering.
- Weakness and loss of coordination.
- Difficulty in performing tasks.
- Makes poor decisions.
- Loss of consciousness.
- Breathing and heartbeat slow or absent.

**c. First Aid**

- Monitor breathing and circulation.
- Prevent further heat loss, shelter patient from wind and water.
- Replace wet clothing with dry. Cover patient’s head.
- If mild signs/symptoms, you may add heat to the neck, armpits, and groin. If moderate to severe symptoms, prevent further heat loss and seek medical aid.
- Do not give alcohol, tobacco, or caffeine.
- Take care not to burn patient if you add heat to the body.
4.29. Poisoning

a. Introduction

A poison is any substance that can harm the body. In the United States there are more than a million cases of poisoning reported each year. While some are suicide or even murder attempts, most are caused by accidental exposure. These accidents usually involve common substances such as cosmetics, medications, petroleum products, and pesticides. Surprisingly most chemicals in everyday use contain substances that are poisonous if misused. While we usually think of chemicals around us when poisoning is mentioned, there are other sources as well. Mushrooms and other common plants can be poisonous if eaten. Bacterial contaminants in food may produce deadly diseases such as botulism. Some poisons may have a much greater effect on one person than another. Some may be far more serious to children or the elderly. Poisons may enter the body by injection, absorption, inhalation, or ingestion.

b. Injected poisons

1. Symptoms

- Noticeable stings or bites on the skin
- Puncture marks
- Blotchy skin
- Pain or itching at the site
- Swelling or blistering at the site
- Burning sensation at the site followed by pain spreading throughout the body.

4. First Aid

- Remove jewelry from affected limb to reduce problems caused by swelling.
- Keep the affected limb lower than the heart to limit swelling.
- Call 911 or local emergency assistance number.

c. Absorbed poisons

1. Symptoms

- Skin Reactions (burns or rashes)
- Itching
- Irritation of the eyes
- Headache
- Increased skin temperature
- Abnormal pulse or respiration rates
- Allergic reactions

2. First Aid

- Remove the person from the source of the poison being careful not to get it on you also
- Remove all remaining poison from the skin
• Remove all contaminated clothing
• Call 911 or local emergency assistance number.

d. Inhaled Poisons

1. Symptoms

• Dizziness
• Shortness of breath
• Coughing
• Irritated or burning eyes
• Burning sensations in the mouth, nose, throat, or chest
• Severe headache
• Nausea and vomiting
• Changes in skin color (usually bluish)
• Excessive mucus or tearing
• Blood tinged saliva

2. First Aid

• Remove person from the source of the poison
• Maintain an open airway
• Call 911 or local emergency assistance number.
• Give artificial respiration if the victim is not breathing, uses a C.P.R. mask if available to keep from contacting the poison yourself
• Ingested Poisons

1. Symptoms

• Burns or stains around the mouth
• Unusual breath odors or body odors
• Abnormal breathing or heart rates
• Enlarged or constricted pupils
• Excessive sweating
• Excessive drooling or foaming at the mouth
• Pain in the mouth or throat, or problems in swallowing
• Abdominal pain or tenderness
• Nausea, retching, or vomiting
• Seizures
• Altered state of conscious

2. First Aid If the person is unconscious

• Call 911 or local emergency assistance number.
• Do not give anything by mouth if the person is unconscious
• Look around the area and try to figure out what poison the person ingested. Look for open containers, spilled contents, or residue on the face and hands.
• Maintain an open airway
• If the person stops breathing give rescue breathing (use a C.P.R. mask if one is available)
Position the person on their side so that if they do vomit the vomitus does not enter the lungs.

3. If the person is conscious

- Try to figure out what poison the person ingested. Look for open containers, spilled contents, or residue on the face and hands. Ask the person what they took and how much they ingested.
- Call the local poison control center or activate emergency medical services system (call 911 or local emergency assistance number). Follow instructions provided by the poison control center.
- Do not give anything by mouth if the person is having seizures
- Have the person sit in a comfortable position and monitor them closely.

4.30. Obstructed Airway

a. Introduction

Obstructed airways are the cause of death in thousands of people each year. You may see someone choke on food, or find someone that was unconscious and after determining that they were not breathing, find you can’t inflate their lungs with mouth-to-mouth resuscitation. In order to restore breathing, you need to clear the victim’s airway.

b. Conscious Victims

If the victim is coughing you should just encourage them to cough up the obstruction. Watch the victim closely while they try to clear their airway. There may be high pitched noises, very weak coughing, or they may have extreme difficulty breathing. Ask the person if they can still breathe. If they cannot breathe tell them that you can help.

1. Call 911.
2. Stand behind the victim and wrap your arms around their abdomen.
3. Make a fist and place the thumb against the victim’s abdomen, slightly over the navel.
4. Place the second hand on top of the first and press firmly into the abdomen with a quick upward thrust. Repeat the thrusts until the object is expelled or the victim becomes unconscious.

c. Unconscious Victims

If you find someone that is unconscious and not breathing, and you cannot get air into them by using mouth-to-mouth resuscitation, re-tilt the head and try again. If you still cannot get any air into the victim, or if you had been trying to clear an obstructed airway on a conscious victim and they pass out, you need to help clear their airway.

1. Call 911.
2. Position the victim on their back.
3. Straddle the victim’s legs with your hands over their stomach where you can watch their mouth.
4. Find their navel with one hand and place the heel of your other hand on their stomach by the navel, between the navel and the chest.
5. Press into the victim’s stomach with quick upward thrusts.
6. After you have done five thrusts, move to the victim’s head. Open the victim’s mouth and look for the obstruction.
7. Open the victim’s mouth by grasping the tongue and lower jaw between your thumb and index finger. Lift the lower jaw. Make a finger sweep across the back of the victim’s throat with a hooking action to try to remove the obstruction.
8. Attempt to give a breath. If the breaths will not go in, repeat the sequence.

d. Obese or pregnant victims. If you have an extremely obese victim, or the victim is pregnant, we need to modify the procedure used. With
a pregnant victim, we do not want to endanger the baby by squeezing in the abdominal area. With an obese victim you cannot reach around to squeeze in that area.

   - Call 911.
   - Stand behind the victim and wrap your arms around their chest.
   - Make a fist and place the thumb side against the victim’s chest with the fist on the lower half of the breast bone.
   - Place the second hand on top of the first and squeeze firmly with a quick thrust. Repeat the thrusts until the object is expelled or the victim becomes unconscious.

2. Unconscious Victims

   Call 911.

   - Position the victim on their back.
   - Kneel beside the victim.
   - Place your hand on the chest on the lower half of the breast bone in the same manner used in Heart Compression (Rule 1015).
   - After you have done five thrusts, move to the victim’s head. Open the victim’s mouth and look for the obstruction.
   - Open the victim’s mouth by grasping the tongue and lower jaw between your thumb and index finger. Lift the lower jaw. Make a finger sweep across the back of the victim’s throat with a hooking action to try to remove the obstruction.
   - Attempt to give a breath. If the breaths will not go in, repeat the sequence.

Section 5.0
Motor Vehicle Operation

5.01 Drivers

Drivers of vehicles shall be familiar with and obey all State Vehicle Codes, local traffic rules and ordinances, traffic control signs, posted speed limits, parking restrictions, cell phone restrictions and all Employer rules and regulations governing vehicle operation.

Section 6.0
Metal Tower Construction

6.01 Assembling and Erecting

(a) All excavations shall be performed in accordance with the provisions of Construction Safety Orders.

   (1) A designated employee shall be used in directing mobile equipment adjacent to footing excavations.

   (2) No one shall be permitted to remain in the footing excavation while equipment is being spotted for placement.

(b) Guy lines shall be used as necessary to maintain sections or parts of sections in position, and to reduce the possibility of tipping.
(c) Members and sections being assembled shall be adequately supported.

(d) When assembling and erecting towers, the provisions of subdivisions (1), (2) and (3) of this paragraph shall be complied with.

(1) The construction of transmission towers and the erecting of poles, hoisting machinery, site preparation machinery, and other types of construction machinery shall conform to the applicable requirements of this article.

(2) No one shall be permitted under a tower that is in the process of erection or assembly, except as may be required to guide and secure the section being set.

(3) When erecting towers using hoisting equipment adjacent to energized transmission lines, the minimum clearance distances are required as per State law.

(e) Erection cranes shall be set on a firm foundation and when the cranes are so equipped, outriggers shall be used.

(f) Tag lines shall be utilized to maintain control of tower sections being raised and positioned.

(g) The loadline shall not be detached from a tower section until the section is adequately secured.

(h) Except during emergency restoration procedures, erection shall be discontinued in the event of high wind or other adverse weather conditions that would make the work hazardous.

(i) Equipment and rigging shall be regularly inspected and shall be maintained in a safe operating condition.

(j) Traffic control shall be provided where applicable.

6.02 Stringing or Removing Conductors

(a) Precautions shall be taken to protect all employees from any accidental contact between the conductors being installed or removed and any energized conductors.

(b) Strains to which poles or structures will be subjected to shall be taken into consideration, and necessary action taken to prevent failure of supporting structures.

(c) A briefing shall be held setting forth the plan of operation, the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed and the clearance authorization required.

(d) When there is a possibility of the conductor accidentally contacting any energized high voltage circuit or receiving a hazardous induced voltage build-up, the conductor being installed or removed shall be grounded or provisions made to isolate or insulate the employees.

(1) If an existing high voltage line being crossed is de-energized, proper clearance authorization shall be secured and the line grounded at or on both sides of the crossover or the conductors being crossed shall be considered energized.

(2) When crossing over or within 10 feet under conductors energized in excess of 300 volts, rope nets or guard structures shall be installed unless provision is made to isolate or insulate the workmen or the energized conductor. Where practical, the automatic re-closing feature of the circuit interrupting device shall be made inoperative. In addition, the line being strung shall be grounded.
on either side of the crossing or considered and worked as energized.

(e) Conductors shall be kept under control by the use of tension reels, guard structures, tielines or other means to prevent contact with energized circuits.

(f) Guard structures shall be of adequate dimension and strength to safely support anticipated loads.

(g) Reel handling equipment, including pulling and braking machines, shall have ample capacity, operate smoothly, and be leveled and aligned in accordance with the manufacturer's operating instruction.

(h) Suitable communications between the reel tender and pulling rig operator shall be provided.

(i) Each pull shall be snubbed or dead-ended at both ends before subsequent pulls are made.

(j) Adjacent to Energized High Voltage Lines.

(1) Prior to stringing or removing conductors adjacent to an existing energized overhead high voltage line, a determination shall be made to ascertain whether hazardous induced voltage buildups will occur. When it has been determined that such hazardous induced voltages may exist, the Employer shall comply with the following provisions (a through h) unless the line is worked as energized.

a. The tension stringing method or other methods that preclude unintentional contact between the lines being pulled and any employee shall be used.

b. All pulling and tensioning equipment shall be grounded or shall be considered as energized and shall be barricaded, isolated or insulated.

c. A ground shall be installed between the tensioning reel set-up and the first structure in order to ground each bare conductor, sub-conductor, and overhead ground conductor during stringing operations.

d. Each bare conductor, sub-conductor, and overhead ground conductor shall be grounded at the first tower adjacent to both the tensioning and pulling set-up and in increments so that no point is more than 2 miles from a ground.

(i) The grounds shall be left in place until conductor installation is completed.

(ii) Such grounds shall be removed as the last phase of aerial cleanup.

(iii) Except for traveling type grounds, the grounds shall be placed and removed by use of a non-conductive means.

e. Conductors, sub-conductors, and overhead ground conductors shall be grounded at all dead-end or catch-off points.

f. A ground shall be located at each side and within 10 feet of working areas where conductors, sub-conductors, or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.

g. The conductors, sub-conductors, and overhead ground conductors being worked on shall be bonded to the tower at every work location.
h. Employees standing on the ground shall not be permitted to contact equipment or machinery working near energized lines or equipment unless the employee is using suitable protective equipment for the voltage involved.

6.03 Rigging

(a) The rated capacity of catch-off anchors, rigging, and hoists shall not be exceeded.

(b) The design load rating shall not be exceeded for the stringing lines, pulling lines, sock connections, and all load-bearing hardware and accessories.

(c) Pulling lines and accessories shall be inspected regularly and replaced or repaired when damaged.

6.04 Grips

Grips shall only be used for the purpose for which they are designed.

6.05 Pulling Line

While the conductor or pulling line is in motion:

(a) Employees on wood poles shall not be permitted to be on the cross-arm.

(b) Employees on steel structures shall not be permitted to be on the cross-arm except as necessary to install the conductor or pulling line into the stringing sheaves.

(c) Employees on the ground shall not be permitted directly under the conductor or pulling line in motion except as necessary to perform work directly related to the stringing operation.

6.06 Clipping

A transmission clipping crew shall have a minimum of two structures "clipped-in" between the crew and the conductor being sagged in the adjacent pull. Refer to Section 2 grounding.
Section 7.0
Entering and Working In Underground Structures

7.01 Qualified persons

Only qualified persons shall be assigned to work on energized underground conductors or equipment. Persons in training who are qualified by experience and training shall be permitted to work on energized underground conductors or equipment while under the continuous supervision or instruction of a qualified electrical worker.

7.02 Access, Egress

A ladder shall always be used in entering or leaving a manhole or vault. Climbing into or out of manholes or vaults by stepping on cables or hangers is forbidden.

7.03 Confined Space Safeguards

(a) Whenever an employee enters a vault, manhole or similar below ground enclosure, there shall be an employee available in the immediate vicinity to render emergency assistance as required. (A protective device placed over the opening does not change this requirement.)

(b) Whenever the cover is removed from a vault or manhole or similar structure, adequate warning devices shall be displayed in locations conspicuous to pedestrians and vehicular traffic. These warning devices shall not be removed until permanent covers are in place.

7.04 Precautions Before Commencing Work in Confined Space

(a) No employees shall be permitted to enter or remain within any manhole, vault, or similar structures unless the atmosphere has been tested and determined to be safe for entry and remains safe. The manhole or vault shall be tested with an approved tester prior to entering, and with sufficient frequency to ensure that the development of dangerous air contamination, oxygen enrichment and/or oxygen deficiency does not occur during the performance of any operation. The employee shall determine that the instrument is in proper working order. A written record of such testing results shall be made and kept at the worksite for the duration of the work.

(b) If it is not feasible to ensure the removal of dangerous air contamination, oxygen enrichment and/or oxygen deficiency, “Do Not Enter This Space” and contact the company’s Safety Personnel or other qualified persons designated by the company for assistance.

(c) Whenever an employee enters a manhole, vault, or similar structure, they shall make an inspection, including heat scan, to determine if any hazardous conditions exist. Appropriate safeguards shall be applied as required prior to the performance of any work.

7.05 Working on Cable or Apparatus

(a) Every possible precaution shall be exercised to make sure of the correct identity (voltage, circuit, phase, etc.) of the cable or apparatus to be worked upon.

(b) When employees are working in an underground structure, the automatic circuit reclosure on the circuit being worked shall be made non-automatic.

(c) When work is performed that requires the connection or separation of shielding on underground cables, or foreign grounds* in the presence of energized primary cables, action shall be taken to eliminate any difference in potential.
Foreign grounds such as hard-line, fish tapes, duct rollers, etc…

(d) All switching in manholes, vaults, or similar structures shall be done from outside the structure, if at all possible.

(e) A clearance, if required, shall be obtained in the prescribed manner whenever any cable or apparatus is to be de-energized and cleared for work.

(f) The cable or apparatus shall be considered energized and worked with adequate protective devices (rubber gloves shall not be considered to be suitable devices on voltages in excess of 7,500 volts) until it has been:

1. Tested with an approved device and proven to be de-energized,
2. Grounded from all possible sources of power (including transformers and secondary backfeed),
3. Proved de-energized at the work location.
4. Where cables are not permanently identified by tags or otherwise, diagrams and information establishing positive identification and position of the cables shall be supplied to the workers.

(g) Employees may work in the high-voltage compartment of pad mounted transformers and similar equipment installed above ground and energized in excess of 7500 volts phase to phase, provided the work is done by suitable devices. Rubber gloves shall not be considered to be suitable devices.

(h) Energized cables over 600 volts shall be moved only under the direction of the employee in charge.

7.06 Static Charge on De-Energized Cables

Before working on any section of cable or apparatus to which cable is connected, care must be exercised to insure that the cable has been grounded to drain off any static charge.

7.07 Grounding Procedures

(a) Cables and equipment to be grounded shall be clearly identified and isolated from all sources of voltage.

(b) Notification shall be obtained from the designated employee that all switches or other points of isolation through which electric energy may be supplied to the conductors or equipment to be worked on have been opened and are plainly tagged indicating that men are at work, and where the design permits, they have been rendered inoperable.

(c) Visual inspection and test with an approved instrument will be made to insure that the cables or equipment have been de-energized.

(d) Guards or barriers will be installed as necessary to prevent contact with exposed energized conductors or equipment.

(e) Grounds will be applied except where their installation or use increases the working hazard. Grounds may be removed for test purposes.

(f) Suitable grounding devices shall be used. They shall be first connected to a ground before being brought
into contact with any de-energized conductors or equipment to be grounded. The other end shall be attached and removed by means of insulated tools or other suitable devices. When removed, they shall be removed from all conductors or equipment before being disconnected from ground.

(g) When required, there shall be a minimum of one ground on the conductors or equipment being worked on:

(1) Between the place where work is being done and each possible source of supply, and/or

(2) At the work location.

(h) One of the grounding devices shall be visible to at least one member of the crew unless one of the ground devices is accessible to an authorized person.

(i) Grounding devices shall be capable of conducting the anticipated fault current and shall have a minimum conductance of No. 2 AWG copper.

(j) When more than one independent crew requires the cable(s), conductor(s), or equipment to be de-energized, a tag for each such independent crew shall be placed on the cable(s), conductor(s) or equipment. Where clearances for such independent crews are controlled by a designated authority having immediate jurisdiction over cable(s), conductor(s) or equipment involved, only one tag need be installed.

(k) Upon completion of work, the employee in charge of each independent crew shall determine that all employees in the crew are clear, and shall report to the designated authority that all tags protecting the crew may be removed.

(l) Prior to the energizing of the cable or equipment, the employee in charge shall ascertain that all employees are clear and grounds are removed.
Section 8.0
Procedures For Helicopter Work

8.01 Safety

While the Employer and Union recognize that the Employer has sole responsibility for the health and safety of all the workmen on the job, and that helicopter work can be more hazardous than the conventional methods, the following rules and guidelines shall be followed:

(a) Prior to any work being done, a safety meeting will be held by those who will perform the work. Each activity to be performed shall be discussed and clearly understood by everyone. Attendance of each crew member and pilot is mandatory. Proper procedures for entering and exiting the helicopter shall be explained to all employees by the pilot. For the safety and conduct of all personnel, the pilot shall have ultimate responsibility in or around the aircraft.

(b) The pilot shall receive signals from only one signal person who is distinguished from the rest of the crew.

(c) When the job includes men working from the skid, a briefing shall be conducted prior to staring work to set forth the plan of operation for that job. This briefing shall include planning to minimize possible hazards of the operation and all personnel exposed shall be informed and directed as to safeguards and escape procedures. Emphasis shall be given to:

   (i) Emergency procedures including mechanical failures resulting in autorotation.

   (ii) Hazards associated with loose items interfering with main rotor and tail rotor blades.

   (iii) Hazards arising from rigging components in external load operations.

   (iv) Hot line crossings and clearances to power lines.

   (v) Head and hand signals as a means of communication between the pilot and the ground crew during external load operations.

(d) Location of ground personnel on the project and other aircraft in the area will be brought to the attention of the pilot. Communications procedures will be explained and discussed in detail. Input will be requested from all, so as to identify and prevent hazards and operational problems.

(e) The pilot and the lineman have the ultimate decision latitude in determining the safest method to use, given all the circumstances of a particular job situation.

(f) Employees refusing to follow safety procedures shall be immediately removed from the project. Work to be performed with helicopters shall be on a voluntary basis. Employees shall not be discriminated against by the Employer for not volunteering to work with helicopters. If the employees and/or Employer determine the work is being done in an unsafe or unprofessional manner, the work will be discontinued until the unsafe conditions are corrected.

8.02 Equipment and Tools

(a) All equipment and tooling shall be free from defects, and/or excessive wear. Each day, rigging shall be visually inspected by the pilot and men performing the work. If deficiencies are found, the item shall be discarded unless repairs can be made to return its condition to like new quality. Economy shall not govern safety or quality of tools and equipment.
(b) Helicopters shall be FAA certified for work to be performed. Pilots shall be qualified under FAR Part 133, Class A, B, & C and demonstrate proficiency prior to performing such work. Pilot logbooks shall be maintained daily. Helicopter maintenance shall be done in accordance with manufacturer's recommendations and the FAA. Fuel shall be stored in proper fuel tanks and dispensed from same by use of filtering devices. Filter systems shall be of the Go-No-Go Type. The system shall be maintained according to manufacturer's recommended specifications. Passengers shall not remain in helicopters during fueling operations. Fueling shall be done with care so as not to allow contaminants to enter the fueling process. Drips, spills and excess fuel shall be removed from the aircraft immediately. A pre-flight inspection of the helicopter shall take place each day prior to any work being done. A pilot's checklist shall be completed daily. A copy of the checklist shall be kept in the aircraft at all times. Long lines used to carry loads shall be inspected daily and replaced immediately should any damage occur. Cargo release hooks operated by the pilot shall have a manual release device. Communication shall be operable at all times from helicopter to helicopter, helicopter to workmen working below and pilot to passenger. If communications are interrupted, operations shall cease until they are restored.

8.03 Receiving Loads While Working Aloft

(a) Workmen receiving loads while aloft shall be safely tied off to the structure by the use of approved Lineman's safety strap. A suitable hand line shall be carried up the tower by the first workman. They shall have stable footing before receiving any loads from the helicopter. No loose fitting clothes shall be worn that could become entangled in sling load operations.

(b) Loads shall not be hovered directly above the workmen at any time; except that qualified employees may function under such aircraft for that limited period of time necessary to guide, secure, hook or unhook the loads.

(c) When installing large loads such as tower tops and bridges, the use of a positive guide system shall be utilized to limit the employees' exposure to the suspended load.

(d) At NO TIME will there be less than two (2) workmen on the tower.

8.04 Installing Insulators

(The following are some examples of installing insulators. They do not preclude the utilization of another suitable method.)

(a) "V" Strings.

1. "V" string insulator assemblies shall be installed by the use of a spreader bar of sufficient length to pin each string to the tower attachment point.

2. The helicopter shall bring the assembly into the tower so that the assembly is horizontally equal to or below the men in the tower.

3. The men shall not attempt to pin both sides at the same time. The outside end of the arm shall be pinned first. One string shall be permanently pinned before attempting to pin the other string.

4. One designated signalman shall signal the pilot to lower the spreader bar to place the weight of the assemblies in their permanent position. When the Journeyman has determined the assemblies are secure, they shall disconnect the slings and signal the pilot to depart from the tower.

(b) Dead End Strings.

1. The designated signalman shall signal the pilot to position the ladder to one side of the permanent dead end attachment point on the tower. The designated signalman shall signal the pilot to release the load when the
ladder is secure. The Lineman then attaches safety chains and ground wire, and then descends the ladder and safeties off.

(2) The designated signalman then guides the pilot to attach the insulator string to the permanent attachment point. Once the permanent pin is securely fastened, the designated signalman shall signal the pilot to depart form the tower.

8.05 Installing Conductor Travelers

(The following examples are one method of installing travelers. They do not preclude the utilization of another suitable method.)

(a) Landing Ladder: The helicopter shall come in with ladder as the Lineman guides hooks to the bridge rail and the pilot releases the load when instructed by the designated signalman.

(b) The Lineman then attaches safety chains and ground wire; then they descend the ladder and safety off.

(c) The helicopter then comes with the traveler. At approximately 200 feet away. Designated signalman starts to signal pilot as to how load is in relation to position on ladder. A ground will be attached to the load when it is within reach to drain off static electricity.

(d) The designated signalman then signals to position traveler for attachment to insulators.

(e) When Linemen have successfully completed their task, the designated signalman will signal to the pilot to slack off slowly on the load and the Linemen then release the rigging.

(f) The Lineman unbelts, goes up the ladder, back onto the arm and belts off to the tower. The helicopter comes back and the Lineman hooks the ladder to the long line, the helicopter then moves the ladder to the next position and the process is then repeated.

8.06 Cargo Loading and Handling

(a) All cargo shall be loaded and secured under the direction of the pilot or pilot's designee.

(b) No passenger shall be transported in the helicopter with a sling load and no person shall be transported as an external or sling load, except in accordance with 14 CFR 133, Class A, B, & C.

(c) Explosives and other "dangerous materials" shall not be transported except as authorized by F.A.A.

(d) All sling loads, including line-stringing devices, shall be attached only to quick-release devices. Steel or metallic sling ends shall be of the pressed sleeve or swedged eye-type, or equivalent. Tag lines shall be of a length or secured in such a manner that will not allow their being drawn up into the rotors.

(e) Automatic release devices are prohibited in all construction operations where ground crews are used. The devices shall be activated only for actual placement of loads. Electrical release devices shall have mechanical back-up, be checked each day of operation, and be designed to prevent inadvertent operation.

(f) When stringing conductive lines or conductors, there shall be radio communication between the helicopter and the ground crew.

(g) When stringing lines or conductors close to or parallel to energized lines, conductive lines or reels, payout machines, and conductors shall be grounded as required by the High Voltage Electrical Safety Orders. Hoist wires or other gear shall not be attached to any fixed ground structure.
EXCEPTION: When pulling lines or conductors that are allowed to "pay-out" from a container or roll off a reel.

(h) External sling load operations shall not be performed if electrical storms in the immediate vicinity make the work unsafe.

(i) Load landing operations shall not be performed when the pilot or ground crew deems the wind conditions too unsafe.

8.07 Helicopter Skid and Tower Transfer

(a) After the lineman are belted on to the helicopter via the attach points with the shock lanyard, positioning belt and the proper tools and hardware for the job loaded onboard, the pilot will maneuver the helicopter up next to the structure so that the lineman can place his tools and hardware on the structure and then transfer himself to the structure.

(b) The rear door shall be removed and the lineman must attach to a Class A external load attachment point approved by the FAA for external cargo operations.

(c) All structures shall be bonded by cable to the helicopter prior to the lineman transferring between the helicopter and the structure. Such bonding will be done utilizing approved cables with spring loaded quick release clamps.

(d) It is extremely important that, whatever the helicopter is bonded to, it must be the same object that the lineman transfers onto. In the case of an isolated static system, grounds from the structure to the wire shall be used if the Lineman cannot safely transfer without coming in contact with the static. If this is the case then the helicopter should be bonded to the wire and then the wire grounded to the structure, in that order.

(e) Once the helicopter is properly bonded and if necessary, the structure’s static grounded, the lineman is ready to start transferring equipment and material to the structure. Every piece of equipment shall be placed onto the structure in a way so as to prevent any contact with the lower phases. Handlines, hoists, grounds, splices, cables all have the potential to come into contact with the phases and must be tied up in a manner to prevent inadvertent release. Everything should also be placed in a manner that does not interfere with the hand and footholds that will be used for the lineman transfer.

(f) The lineman transfer is accomplished by removing his regular belt harness from one D-ring, then refastening the snap onto the other D-ring so that both snaps of the belt are into one D-ring. The lineman shall not leave the harness hanging without refastening it; this will prevent the harness from catching on the aircraft. Once released and with the helicopter in position, the lineman shall unsnap the large carabiner (attached to the shock lanyard) from the helicopter and attach it to the structure, then proceed onto the structure with both hands and feet free. The lineman will then wait in that position until the helicopter has cleared the tower.

(g) Once the lineman has transferred, the pilot will insure that there is nothing hanging from the lineman’s belt that could possibly get caught on hung up as the helicopter leaves the structure. It is extremely important that the pilot always move away from the structure in a slow and cautious manner so that in the advent of something hanging up, he can maneuver back to the structure and have the lineman free him.

(h) When the lineman is ready to transfer back to the helicopter, the helicopter shall be positioned in the same manner as before. The lineman shall bond the helicopter to the same source and then begin transferring equipment onto the helicopter. It may be necessary at times for the lineman to board the helicopter and, once satisfied, help position equipment into the helicopter. In any case, once equipment is on board the lineman shall transfer to the helicopter, then safety off. Once this has been completed and the bond cable removed, the pilot will depart the structure in a slow and cautious manner so in the case of a hang-up, he can proceed back to the structure so the
lineman can release him. It should also be noted that in the case of a hang-up departing the structure, the
helicopter must be re-bonded to prevent accidental static discharge.

(i) It must be noted that during the transfer, the lineman shall never be safetied off to the structure and the helicopter
at the same time. The pilot should always have the option of departing the structure at any time for whatever
reason. The practice of un-belting his primary safety and then removing his shock lanyard from the helicopter and
attaching it to the structure will, in the event of an emergency, prevent the lineman from falling. This also allows
the pilot the option of performing an emergency procedure without worrying about the lineman being attached to
the helicopter and the tower at the same time.

(j) If followed, these guidelines will minimize the risks involved in these procedures. Again, before the flight begins
is the time to analyze a particular situation. If a special condition exists, you may have to deviate slightly to gain
more safety, but it should be an exception.

8.08  Working from the Helicopter Skid

(a) Linemen must use a Federal OSHA approved safety harness.

(b) The rear door shall be removed and the lineman must attach to a Class A external load attachment point approved
by the FAA for external cargo operations.

(c) Aircraft CG limits must be observed.

(d) Aircraft performance and controllability must not be in question prior to the task to be performed. In the case of
adverse wind angles, the helicopter will be positioned in the approximate position desired and checked for
controllability.

(e) STATIC DISCHARGE: If the purpose of the lift is to place the lineman onto the tower, then the potential static
charge will be dissipated by touching the skid to the tower. If the purpose of the lift is to work on an ungrounded
item, such as conductor wire or static wire, then the lineman will evaluate the situation and use either hot gloves
or jumper cables to bond the helicopter. Jumper cables, once attached, shall be able to be removed with minimal
force so as to allow the helicopter to maneuver away if needed.

8.09  Helicopter Rules for Human External

(a) Incorporated hereto by reference is the Helicopter Rules for Human External Cargo (HEC) that was approved on
December 1, 2010

Scope
All work procedures are written for the performance of helicopter powerline work are in compliance with the
Federal Aviation Administration (FAA) regulations contained in Federal Aviation Regulation (FAR) 133, Class A
B and D external loads.

All external load operations, in addition to the above mentioned regulations shall also comply with the

General
No Employee will be required to perform or undertake helicopter line worker activities. Helicopter line work
shall be performed by volunteer line workers only. No employee shall be discriminated against who refuses to
volunteer for this work.
Before each flight, the supervisor in charge, the pilot, and the helicopter line workers(s) must analyze and address any conditions specific to the work situations and agree on the safety measures required to address those conditions. When determining and selecting the best method to use, the supervisor in charge, the pilot, and the helicopter line workers(s) must ensure that safe distances can be maintained between all parts of the helicopter and any energized conductors, de-energized conductors, coworkers and/or the structure.

If, at any time either before performing the work or while performing the work, the helicopter line workers(s), the supervisor in charge, or the pilot, in his or her opinion, believes that dangerous or unsafe conditions exist that could jeopardize the safety of the operations, the helicopter line workers supervisor in charge, or pilot has the right to postpone or stop the operation until those safety concerns have disappeared or have been corrected. These conditions include, but are not limited, to the following:

- Inclement weather conditions
- Insufficient Clearances
- Exceeding Helicopter load limits
- Structure or Conductor damage that causes a safety concern
- Any other condition that may adversely affect the safety of the operation.

“Pilot in Command” means the person who –
1. Has final authority and responsibility for the operation and safety of the flight;
2. Has been designated as pilot in command before or during the flight; and
3. Holds the appropriate category, class, and type rating, if appropriate, for the conduct of the flight

**Equipment/PPE**

**Head Protection**

All helicopter line works must use an ANSI Z89.1, Type 1, Class E, approved helicopter helmet or Hard Hat equipped with a 3-point chin strap securely fastened. Every precaution must be taken to prevent the possibility of a hard hat or helmet from being blown off and contacting the helicopter rotor blades.

**Fall Protection:**

Except when conducting helicopter to tower or pole transfers, the helicopter line workers shall be attached 100% of the time to a rated/approved anchorage point while working as an external load. Workers shall either wear a rope access type harness or a combination linemans body belt and full body harness both equipped with a work positioning strap and shock absorbing lanyard. All lanyards and positioning straps used by helicopter line workers must be positioned to prevent possible hang-ups while transferring to and from a structure and while egressing the tower or landing zone.

When work is to be performed while hanging from a long-line and not just for the purpose of transporting the worker to the structure and/or conductor, the use of a boatswains chair shall be required.
**Tools:**

No tools shall be carried in on the lineworker's body belt that could fall out during transport. Any tools that could fall off the belt must be secured by a lanyard. Tools that could impede the lineworker's movements or that could hang up on the helicopter or the structure should also not be carried by the lineworker.

**Hearing Protection:**

Helicopter line workers always must use either approved hearing protection or an approved flight helmet or gear while working from a helicopter. All ground-support personnel must wear hearing protection while working near helicopters, as well.

**Visual Inspections:**

Visual inspection of supporting the structures and conductors shall be performed by the lineworker prior to transferring any worker from the helicopter to the structure or conductor to identify any condition that might jeopardize a line worker's personal safety or raise concern for the helicopter line worker, the supervisor in charge, or the pilot. Any unsafe conditions that are discovered during the inspection process must be corrected before performing the helicopter line-work procedures. If these conditions cannot be corrected, use an alternate work method.

**Fly Yards or other Landing Zone Locations**

Fly yards or other landing zone locations used for helicopter line-work must be located as close as practical to the area work is to be performed. All efforts shall be made to limit any worker from being transported via long line or skid for more than 10 minutes fly time.

Transferring to a Pole or Structure can be accomplished by either using a rope access harness or full body harness and linemans body belt both equipped with a work positioning strap. The lineworker can travel to the structure or conductor while standing on the grappling hook provided he is using the above mentioned devices attached to an approved load rated eye in the long-line. Dorsal D-rings shall only be used for fall arrest and are prohibited from being used as an attachment point for lifting and transporting the lineworker.

Before each flight begins, the pilot, the supervisor -in-charge and the helicopter line worker must analyze and address specific work conditions and agree on the safety measures to take when addressing those conditions.

If a special condition exists, it may be necessary to adjust these procedures slightly to provide a greater margin of safety. Adjustments to these procedures should be considered only as a temporary exception for the duration of the special condition. If changes occur an additional tailboard is required to address all such changes to the operation.

**Grounding**

When the requirements to perform this work dictate that the line be grounded, refer to the grounding section of the NECA/IBEW safety manual (Red Book). Employees must follow all applicable protective grounding rules before performing any work.

**Communications**

Communications between the lineworker and pilot may be in the form of hand signals, head signals, direct verbal
communication, or when practical the use of radio communications. If radio communications are used each employee must also be proficient in the other forms of communications in case of equipment malfunction.

When using head signals the lineman must have a visually enhanced hard hat or helmet with clear markings to indicate the desired movement. Any signals other than up or down will require the use of hand signals.

**HELICOPTER HAND SIGNALS**

- **Move Right**
  - Left arm extended horizontally; right arm sweeps upward to position over head.

- **Hold-Hover**
  - The signal "Hold" is executed by placing arms over head with clenched fists.

- **Move Left**
  - Right arm extended horizontally; left arm sweeps upward to position over head.

- **Takeoff**
  - Right hand behind back; left hand pointing up.

- **Move Forward**
  - Combination of arm and hand movement in a collecting motion pulling toward body.

- **Land**
  - Arms crossed in front of body and pointing downward.

- **Move Rearward**
  - Hand above arm, palms out using a noticeable shoving motion.

- **Move Upward**
  - Arms extended, palms up; arms sweeping up.

- **Release Sling Load**
  - Left arm held down away from body. Right arm cuts across left arm in a slashing movement from above.

- **Move Downward**
  - Arms extended, palms down; arms sweeping down.
Transferring from long-line to structure or conductor

The pilot has control of the load and has the ability to release the load in emergency situations therefore the lineworker can attach either the positioning strap or fall arrest lanyard to the pole or structure before disconnecting the helicopter from the load line. The time attached to either the structure or pole and load line shall be kept to a minimum.

On steel structures up to 2 workers may be transferred at the same time provided the pilot and lineworkers all agree that it is safe to do so simultaneously. If anyone feels it is not safe to perform this method on any particular job or location then the method shall be modified to limit the transfer to 1 worker at a time.

On wood poles this method will always be limited to 1 worker at a time.

Training Requirements

Training for lineworkers who voluntarily choose to use this work method will consist of both General training established jointly by NECA and the IBEW as well as site specific training that will be performed by the contractor and Helicopter Company performing the work.

Section 9.0
Energized Switchyards and High Voltage Substations

9.01 Work Near Energized Equipment and Facilities

(a) No person other than a qualified electrical worker shall perform work or take any conducting object within the area where there is a hazard of contact with energized conductors, unless they are directly under the observation of a qualified person.

(b) When working around energized equipment, precautions shall be taken to prevent any material or tools from accidentally contacting energized conductors or equipment.

(c) Temporary barriers. Suitable temporary barriers in or adjacent to the work area shall be used to prevent accidental contact by workers with energized high voltage equipment.

(d) Tape barricades. Suitable barricade tape shall be used to mark off and bar approach to dangerous areas. An employee shall not be permitted to cross over or under the tape while it is barricading an area, except in an emergency or when work in progress requires the employee to enter the dangerous area. While in the area, they shall be continuously watched by a qualified person for the purpose of preventing an accident.

(e) Use of vehicles, gin poles, cranes and other equipment in restricted or hazardous areas shall at all times be controlled by designated employees.

(f) When operated by a Qualified Electrical Worker, mobile cranes, hoists and derricks shall not be permitted closer to exposed energized conductors or equipment than the distances set forth below.
KILOVOLTS | MINIMUM APPROACH DISTANCES (MAD)
---|---
2 to 15 | 2 ft. 1 in.
15 to 36 | 2 ft. 4 in.
36 to 46 | 2 ft. 7 in.
46 to 72 | 3 ft. 0 in.
72 to 121 | 3 ft. 4 in.
121 to 145 | 3 ft. 7 in.
145 to 169 | 4 ft. 0 in.
169 to 242 | 5 ft. 3 in.
242 to 362 | 8 ft. 6 in.
362 to 552 | 11 ft. 3 in.
552 to 765 | 15 ft. 0 in.

(g) When operated by a Non-Qualified Electrical Worker, mobile cranes, hoists and derricks shall be positioned, equipped, protected, and/or operated so that no part comes closer to energized power lines than indicated in the below table:

<table>
<thead>
<tr>
<th>Nominal Voltage kV Phase to Phase</th>
<th>Minimum Required Clearance (Ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.6 to 50</td>
<td>10 ft.</td>
</tr>
<tr>
<td>50 to 75</td>
<td>11 ft.</td>
</tr>
<tr>
<td>75 to 125</td>
<td>13 ft.</td>
</tr>
<tr>
<td>125 to 175</td>
<td>15 ft.</td>
</tr>
<tr>
<td>175 to 250</td>
<td>17 ft.</td>
</tr>
<tr>
<td>250 to 370</td>
<td>21 ft.</td>
</tr>
<tr>
<td>370 to 550</td>
<td>27 ft.</td>
</tr>
<tr>
<td>550 to 1,000</td>
<td>42 ft.</td>
</tr>
</tbody>
</table>

(h) Grounding. Refer to Section 2.6.

(i) Access to Insulators. The Employer shall furnish suitable aerial lift equipment, portable platforms, or other devices to permit employees to work on insulators or bushings attached to poles, towers, structures, or equipment when such insulators or bushings are not otherwise accessible.
GOOD AND BAD RIGGING PRACTICES

Use of Chokers

Good
No cutting action on running lines

Good

Bad—Because of cutting action of eye splice on running line

Bad—Bolt on running line can work loose

Eye Splices

Good Practice—
No use of thimble in eye splice

Good Practice—
Use of thimble in eye splice

Bad Practice—
Wire rope knot with clip. Efficiency 50% or less

Bad Practice—
Thimble should be used to increase strength of eye and reduce wear on rope

Hook Slings

Bad Practice—
Hook openings should be turned out

Good Practice—
Hooks are turned out
GOOD AND BAD RIGGING PRACTICES

Double slings shall be used when hoisting
2 or more pieces of material over 12 feet long.

Right—Load over 12' long
Wrong—Load over 12' long

Eye Bolts

Vertical lift on eye bolt is good practice
Bad Practice—Lifting on eye bolt from an angle reduces safe loads as much as 90%

Suspending Needle Beams or Scaffolds

Hoisting Structural Steel

Bad Practice—Can bend flanges and cut rope
Good Practice—Use space blocks and pad corners
Bad Practice—Steel can cut rope
Good Practice—Sharp corners padded
APPLICATION OF WIRE ROPE
U-BOLT CLIPS
Crosby Type

1. CORRECT METHOD—U-Bolts of clips on short end of rope.
   (No distortion on live end of rope.)

2. WRONG METHOD—U-Bolts on live end of rope.
   (This will cause mashed spots on live end of rope.)

3. WRONG METHOD—Staggered clips; two correct and one wrong.
   (This will cause a mashed spot in live end of rope due to wrong position of center clip.)

4. After rope is in service, and is under tension, tighten clips to take up decrease in rope diameter.

Number of Crosby or Safety Clips and Distance Between Clips Needed for Safety

<table>
<thead>
<tr>
<th>Diameter of Rope (Inches)</th>
<th>Number of Clips</th>
<th>Distance Between Clips</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8—3/4 Inc.</td>
<td>3</td>
<td>Distance between clips should be 6 times the nominal diameter of the cable.</td>
</tr>
<tr>
<td>3/8—3/4 Inc.</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>11/16—13/16</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>13/16—11/4</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
No. 1 – Examine entire outer surface for Burns, Cuts, Cracks, Puncture and Weak Spots

No. 2 - By stretching cuff slightly, abrasions and weak spots will be more evident

No. 3 - Examine inside of the cuff for tears, punctures, etc.
INSTRUCTIONS FOR SHARpening GAFFS
(SPURS) ON CLIMBERS

1. Always use sharp file. NEVER grind to a point on any kind of wheel as you are likely to set up heat which will spoil the temper of the gaff and make it dangerous to use.

2. Set climber in a vise with the gaff uppermost and the stirrup of the climber turned down so that you can file from heel to point of gaff. File toward the point and down to the edges of the underside of the gaff. Remove only sufficient material to make a good point.

3. Do not make a needle point. File both side slopes, but not the top of gaff, to even rounded edges, so that the final point is always in the top ridge of the gaff.

4. The underside of the gaff should be left perfectly straight to within ¼" of the point, then rounded slightly toward the top ridge of the gaff on a radius of ¼". At a distance ¾" back from the point, you should have a width of approximately ½" measured on the underside of the gaff. The remainder of the underside should be kept perfectly straight.

5. For safety, climbers should not be used after the gaffs are worn or filed to 1¼" long, measured on the underside of the gaff. When climbers get in this condition, they should be regaffed or a new pair obtained. By following these simple instructions, a satisfactory job can be secured and no unnecessary risks will be taken.
### Safe Load of New Combination Synthetic (Spec. #1) and Live Line Rope (Spec. #4) and Tackle in Pounds

<table>
<thead>
<tr>
<th>Diam. Rope Inches</th>
<th>Min. Size Blocks Inches</th>
<th>Straight Pull</th>
<th>1 Part Fall 1 Single Block</th>
<th>2 Part Falls 2 Single Blocks</th>
<th>3 Part Falls 1 Single 1 Double Block</th>
<th>4 Part Falls 2 Double Blocks</th>
<th>5 Part Falls 1 Double 1 Triple Blk.</th>
<th>6 Part Falls 2 Triple Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>4</td>
<td>650</td>
<td>591</td>
<td>1074</td>
<td>1466</td>
<td>1781</td>
<td>2019</td>
<td>2203</td>
</tr>
<tr>
<td>1/4</td>
<td>6</td>
<td>1300</td>
<td>1182</td>
<td>2149</td>
<td>2932</td>
<td>3562</td>
<td>4037</td>
<td>4407</td>
</tr>
<tr>
<td>3/4</td>
<td>8</td>
<td>2200</td>
<td>2000</td>
<td>3636</td>
<td>4962</td>
<td>6027</td>
<td>6832</td>
<td>7458</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>3300</td>
<td>3000</td>
<td>5455</td>
<td>7444</td>
<td>9041</td>
<td>10249</td>
<td>11186</td>
</tr>
</tbody>
</table>

These values may be reduced by the strength of the blocks, hooks, shackles and anchor points that are used.

### Screw Pin, Round Pin and Bolt Type Anchor Shackles

**Forged Steel — Safe Load in Pounds**

<table>
<thead>
<tr>
<th><em>Shackle size</em></th>
<th><em>Safe Working Load—Pounds</em></th>
<th>Length Inside Inches</th>
<th>Width Between Eyes—Inches</th>
<th><em>Diameter of Pin—Inches</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>1/4</td>
<td>1/2</td>
<td>1/8</td>
<td>3/8</td>
</tr>
<tr>
<td>2000</td>
<td>1 1/4</td>
<td>2 1/2</td>
<td>1 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>4000</td>
<td>2 1/4</td>
<td>3 1/4</td>
<td>2 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>6500</td>
<td>3 1/4</td>
<td>4 1/4</td>
<td>3 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>9500</td>
<td>4 1/4</td>
<td>5</td>
<td>4 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>12000</td>
<td>5 1/4</td>
<td>6</td>
<td>5 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>17000</td>
<td>6 1/4</td>
<td>7</td>
<td>6 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>19000</td>
<td>7 1/4</td>
<td>8</td>
<td>7 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>24000</td>
<td>8 1/4</td>
<td>9</td>
<td>8 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>27000</td>
<td>9 1/4</td>
<td>10</td>
<td>9 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>34000</td>
<td>10 1/4</td>
<td>11</td>
<td>10 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>39000</td>
<td>11 1/4</td>
<td>12</td>
<td>11 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>50000</td>
<td>12 1/4</td>
<td>13</td>
<td>12 1/4</td>
<td>7/8</td>
</tr>
<tr>
<td>70000</td>
<td>13 1/4</td>
<td>14</td>
<td>13 1/4</td>
<td>7/8</td>
</tr>
</tbody>
</table>

*These values also apply to screw pin, round pin and bolt type chain shackles.
* Each fiber in the straight part of a rope takes its proper share of the load. If a knot or hitch of any kind is tied in a rope, its failure under stress is sure to occur at that point. The values given below are approximate, but must be considered when making rope attachments.

**APPROXIMATE EFFICIENCY OF KNOTS IN A PERCENTAGE OF THE FULL STRENGTH OF THE ROPE**

<table>
<thead>
<tr>
<th>Knot Type</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowline Hitch</td>
<td>60</td>
</tr>
<tr>
<td>Weaver's Knot</td>
<td>50</td>
</tr>
<tr>
<td>Square Knot</td>
<td>45</td>
</tr>
<tr>
<td>Overhand Loop</td>
<td>45</td>
</tr>
<tr>
<td>Bowline Hitch, Round Turn, and Half Hitch</td>
<td>60</td>
</tr>
<tr>
<td>Short Splice in the Rope Eysplace</td>
<td>80</td>
</tr>
<tr>
<td>Eysplace over an Iron Coils of the Knots</td>
<td>90</td>
</tr>
<tr>
<td>The efficiency of the knot</td>
<td>100</td>
</tr>
</tbody>
</table>

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