

Accident Prevention Manual

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SNOHOMISH COUNTY PUD SAFETY POLICY

Statement of Policy:

It is the intent of PUD #1 of Snohomish County to provide a safe place to work. To accomplish this goal, we must all make a commitment to work with personal safety in mind. Only with employee commitment to safety and effective safety training can we prevent workplace accidents.

Management:

Management's responsibility is to manage the way work is performed to prevent accidents and injuries. The Leadership Team provides direction and full support of all safety procedures, job training and hazard-elimination practices. The Senior Manager of Safety must stay fully informed of health and safety issues and constantly evaluate the effectiveness of the health and safety program.

Supervision:

Supervisors are directly responsible and accountable for overseeing the safety of their employees. They must stress that performing work accident free is as important as quality and timeliness. Supervisors must manage their employees' work performance with the District's safety policy in mind and take immediate corrective action to eliminate unsafe acts and conditions.

Joint Safety Team:

The Joint Safety Team consists of management and employee representatives who have an interest in the general promotion of health and safety at the District. The team is responsible for making recommendations on improving health and safety in the workplace, as well as reviewing all accidents/incidents reported.

Employees:

Each employee, regardless of his/her position at the District, is expected to understand and follow accepted safety and health practices while performing his/her job duties. This includes:

- Utilizing standard safe work practices while on the job.
- Reporting accidents or near-misses immediately to his/her supervisor.
- Wearing required personal protective equipment based on the work being performed.
- Reporting any unsafe act or condition immediately to his/her supervisor.

Each employee has a personal responsibility for his/her own safety, as well as the safety of fellow workers. If everyone does their part to ensure a safe workplace, we all benefit.

GENERAL SAFETY RULES

The following work rules apply to all employees. Additional rules for specific departments, divisions and other units of the organization are contained in the other applicable parts of these accident prevention rules.

REPORTING A HAZARDOUS OR UNSAFE ACT OR CONDITION

All employees shall work and promote good safety habits. Employees shall report, to the person in charge all hazardous or unsafe working conditions that could cause personal injury or property damage.

The District's Safety Suggestion/Concern Form (which is available on Snoweb and can be submitted anonymously) should be used for reporting suggestions or hazardous or unsafe working conditions that cannot be resolved at the time they were reported to the supervisor.

ANIMAL ENCOUNTER GUIDELINES

The following are guidelines if an employee is attacked or bitten by an animal.

- When an employee experiences an animal attack, he/she should immediately contact the Security Operations Center (SOC) at 425-783-8787. The SOC will call 911 or instruct the employee to call 911 through which Animal Control will be notified. If in the city limits of Everett, Animal Control can only be reached by dialing 425-388-3440. If necessary, an aid car will be dispatched. The SOC will also notify the employee's supervisor and the Safety department. The employee must give the SOC the location or address where the incident occurred as well as a description of the animal for the animal control response.
- The Meter Reading Department Operations Coordinator 425-783-8381 must be notified by the employee's supervisor of any animal attack, regardless of severity. The coordinator will alert Meter Readers assigned to the area, and flag the account with warnings to inform other employees/departments of the potential danger.
- If the attack doesn't break the skin, an aid car is not necessary. The employee is encouraged to seek immediate medical attention to prevent infection and other potential medical problems. After the incident has been reported to the proper authorities, the employee should get medical attention at a facility of his/her choice. If necessary, the Safety department and/or the employee's department supervisor will coordinate transportation to the clinic for treatment. Risk Management will also be notified and a claim number issued. A representative from the Safety department will meet the employee at the hospital or clinic.
- The following response procedures are in effect by The Snohomish County Health Department and Animal Control. If a District employee is bitten, Animal Control will usually quarantine the animal for 10-12 days depending on the animal's condition and record of shots. If the animal should die and there is a concern over the possibility of rabies, the Health Department will send the remains of the animal to a lab for analysis. If there is a problem, the Health Department will notify the employee immediately after the lab results. (According to South County Health Department and Animal Control, there has not been a rabid dog case in over 40 years in Snohomish County and over 20 years in Western Washington.)

• When an animal has bitten an employee, the employee has the option of following up with the animal control agency themselves or requesting the Safety department to follow up and find out the status of the animal.

CONDUCT ON THE JOB

Practical jokes, horseplay, scuffling or any conduct that may subject employees to risk of bodily injury shall not be tolerated.

Only safe, approved work methods and procedures shall be used. Employees shall not take unnecessary risks while performing work activities.

Injuries, no matter how minor, shall be reported to your supervisor as soon as practical. Injuries requiring immediate medical attention (more than first aid), vehicle accidents or damage to District equipment or property shall be reported to the Security Operations Center (425-783-8787) and Energy Control Center (425-783-5040) immediately via radio or telephone.

CLOTHING AND PERSONAL PROTECTIVE EQUIPMENT

Clothing

Employees shall dress in a manner appropriate to their occupation and the hazards of their job. Employees shall refer to their department supervisor for additional clothing/shoe/boot/tool requirements. (See CBA for boot/tool allowance). All employees whose duties expose them to danger of contact with moving parts of machinery or the work process is such that a hazard exists, shall wear clothing that fits closely to the body. Dangling bracelets, rings, watches, necklaces or similar objects shall not be worn. No less than a short-sleeved shirt, long pants and shoes shall be worn on construction sites.

Any District employee, who in the course of performing any type of work is exposed to any potential vehicle traffic, shall wear a flagging vest. See *Transmission, Distribution, Substation*, Section N, page 11, for clothing requirements for employees who are exposed to electrical arc flash.

Hair

Persons working around machinery or in locations that present a hair-catching or fire hazard shall wear caps or a head covering that completely covers or pulls the hair away from such hazard.

Caps with metal buttons or metal visors shall not be worn around electrical hazards.

Personal Protective Equipment (PPE)

Employees whose duties require PPE must identify tasks that would require PPE, have specified what PPE is needed for specific tasks, inform affected employees of the rationale of PPE, select PPE that fits the individual, and verify that a hazard assessment has been made through written certification. (See *Hazard Assessment* Section).

Affected employees shall be able to demonstrate an understanding in the following:

- When PPE is required
- What PPE is necessary
- How to wear the PPE

- The limitations of the PPE
- Proper care, maintenance, useful life and disposal of PPE

Leg Protection

Employees whose duties require them to operate a power chain saw shall wear flexible ballistic nylon pads, sewn or otherwise fastened into the trousers, or other equivalent protection (chaps) that will protect the vulnerable areas of the legs.

Foot Protection

Substantial reinforced-toe footwear, made of leather or other equally firm material, shall be worn by employees in any occupation in which there is a danger of injury to the feet through falling or moving objects, or from burning, scalding, cutting, penetration or like hazard. Tennis shoes, shoes with canvas tops, or thin or soft-soled athletic shoes, open-toed sandals, slippers, dress shoes, or other similar type shoes shall not be worn at construction sites.

Hard Hats

Approved protective hats in accordance with ANSI/ISEA Z89.1 - 2014 shall be worn by District employees and visitors on jobs requiring head protection and in specified areas as required by various departments or divisions. Hard hats should be replaced approximately every five (5) years based on usage.

Hard hats must be worn by all employees who are exposed to hazards that could cause head injury. Examples include but are not limited to flying or propelled objects, falling objects or materials, working around or under scaffolds or overhead structures, or working around electrical conductors that could contact the head. Hard hats shall be worn when working on customer sites that are designated as required hard hat areas regardless of the immediate exposure.

The job site supervisor or lead worker shall require all employees and others entering their work area to conform to the hard hat rule when required. If a question arises, the supervisor will have the sole discretion to determine if wearing a hard hat is required.

Personal Flotation Devices

Employees working on, over or alongside water, where the danger of drowning exists, shall be provided with and wear approved personal flotation devices.

Employees are not considered exposed to the danger of drowning when:

- Working behind standard height and strength guardrails;
- Working inside operating cabs or stations that eliminate the possibility of accidentally falling into the water;
- Wearing approved safety belts with a lifeline attached so as to preclude the possibility of falling into the water.

Prior to and after each use, personal flotation devices shall be inspected for defects that would reduce their effectiveness. Defective personal flotation devices shall not be used.

All personal flotation devices shall be United States Coast Guard-approved.

Hearing Protection

As part of the District's Hearing Conservation Program, employees meeting the criteria of the program will undergo a baseline hearing evaluation at time of hire or transfer and thereafter have an annual hearing test. Any person(s) wishing to review the written program may do so by contacting the Safety department. This program is discussed and reviewed annually at all pertinent safety meetings.

Whenever it is not feasible to reduce workplace noise levels to less than 85 dBA, on a time-weighted average; the work area will be posted with a noise hazard caution sign.

Approved ear protection will be provided by the District and used in such posted areas at all times.

Proper ear protection may consist of any of the following: Ear muffs, custom earplugs, or disposable ear protectors. Plain cotton is not acceptable. Earmuffs are available through the Safety department. Earplugs are available at all storeroom locations.

Eye and Face Protection

High hazard departments refer to Eye/Face Section. Affected employees shall use eye protection that provides side protection when in the vicinity of any substance, flying particles, electrical hazards or chemicals that may cause eye injury. Employees performing work that creates eye hazards shall use specific eye protection. Employees shall wear chemical eye injury goggles when working with chemicals that may splash into the eyes.

Employees shall be provided with and wear eye and face protection when working on or around operations that present potential eye or face injury from physical or chemical-related work.

Employees whose vision requires the use of corrective lenses shall be protected by goggles or their own corrective safety glasses, meeting the requirements of ANSI/ISEA Z87.1 - 2015. The Safety department reimburses employees for a portion of the spectacles' cost for those whose job exposes them to hazards.

Face and eye protection equipment shall be kept clean and in good repair. Use of equipment with structural or optical defects shall be prohibited. All eye and face protection shall be distinctly marked to facilitate identification of the manufacturer.

Safety glasses in various styles and tints are stock coded and available in the District's warehouses.

HAZARD ASSESSMENT OF THE WORKPLACE

In order to maintain compliance, Snohomish County PUD #1 will be required to perform a hazard assessment of **all company work areas**, identify the hazards present, evaluate the PPE available or needed, and certify the assessment in writing. These assessments are kept on file in the Safety department.

Please keep in mind, **this form will only be used for assessment of hazardous areas within the immediate work locations.** For example, areas assessed may include the Warehouse, line dock, Garage, chemical-storage area, pole storage, tool room, maintenance shop, or any other employee work area within the physical location that requires the use of PPE.

You might begin your assessment by asking a few basic questions, such as:

- What equipment, materials or power tools require PPE use? Such as safety eyeglasses, face protection, hard hats, hearing protection, foot protection, hand protection, etc.
- What is the hazard? Such as dust, flying metal from a grinder, hot sparks from arc welding, chemical handling, and material that could crush the feet, etc.
- What PPE is available now? Such as goggles and a full-face shield are located on the grinder, hearing protectors are stored on top of the generator, etc.
- What additional PPE is needed to assure a safe operation? Such as: need to install an "eye protection required" warning sign on the wall above the metal grinder, or need a full-face shield in addition to the goggles and hearing muffs, or proper footwear is required when loading and unloading poles, etc.
- It may be necessary to complete several Hazard Assessment Forms for a specific area, depending upon the number of hazards present. For example, you may need to complete an assessment form for the metal grinder, one for the noisy generator, one for the work table that has a high-pressure air hose, one for the painting booth, one for your chemical storage and handling area, etc.
- Please be as thorough as possible with identifying areas that require an employee to wear PPE while performing a specific activity. Remember, there is no absolute right or wrong way to report this information. The primary purpose of this assessment form is to assess all the work areas that may present a potential hazard to an employee, what PPE is available, and what additional PPE (if any) is needed to make it safe.

You may wish to appoint several knowledgeable employees the responsibility of conducting hazard assessments for a specific area, or to assign that responsibility to your department's Safety Chair Representative. In any case, the following elements must be completed on the Hazard Assessment Form:

- The workplace evaluated
- The actions taken for correction or additions of PPE
- The person certifying that the evaluation has been performed
- The date(s) of the hazard assessment

Upon completion of your hazard assessment, please forward all originals to the Safety department. A copy shall be retained in your department's file.

Please title the file "Hazard Assessment Program."

If you have further questions or need assistance regarding this assessment, please contact the Safety department.

GLOBAL HARMONIZED SYSTEM (GHS)

Employees who have high exposure to hazardous substances will receive annual training by the Safety department. This training is addressed on the Safety website along with a complete list of Safety Data Sheets (SDS) for all chemicals used throughout District facilities.

Information on general instruction/guidelines for the use of the on-line database shall be part of the employee's orientation to the department. The supervisor shall ensure all product SDS's for chemicals available for employee use are reviewed by Environmental Affairs and Safety prior to use.

Hazardous Substances - Emergency Response

Pre-emergency planning, personnel roles, training and communication procedures are required health and safety elements associated with the use of hazardous substances.

Employees are trained to identify chemicals and hazardous substances in their work environment; including recognizing, reporting and taking appropriate action to protect human health and the environment in the event of a chemical spill.

Supervisors are responsible for performing job hazard assessments for hazardous substance storage and use in their operations and will work with their employees and contractors to ensure appropriate safe handling practices are used and emergency response procedures are established. Supervisors can obtain additional assistance from the Safety department and Environmental Affairs to perform job hazard assessments and develop safe work practices for response procedures.

When a spill is discovered, District employees should report the hazardous substance spill to the Energy Control Center, unless the Storm Center is activated, then reporting of spills goes through the Storm Center or Crew Dispatch. Report the following:

- 1. Your name and phone number;
- 2. The spill address and location (pole number, vault number, room number, etc.);
- 3. Any injuries, or fire present;
- 4. The name of the chemical that spilled;
- 5. Estimate the size of the spill in gallons or area;
- 6. Whether the chemical spill is to soil, pavement, water or other medium; District identification number of leaking equipment or vehicle;
- 7. PCB information from label on electrical equipment, if present;
- 8. Environmental conditions such as proximity to storm drain, wetlands, surface waters, which would help prioritize the response and determine the manpower needs.

District emergency responders will come from departments that are responsible for maintaining and repairing the equipment. These employees are trained in the hazards associated with the chemicals in the equipment and in use in their workplace. It is the supervisor's responsibility to make sure that employees responding to chemical spills or working in the immediate vicinity receive and maintain a level of training appropriate for their duties. Specific emergency spill response training is necessary for several operational areas and can be coordinated with the Safety department.

In the event of an emergency response, the District will utilize the same incident command structure required of fire, police, and emergency management services. The District person-in-charge of the incident will be the most senior and qualified employee over the project or operation.

The District person-in-charge is responsible for communicating all applicable site health and safety hazards, implementing the District's Spill Response Site Safety Plan and securing the site from access by the general public. In electrical environments, the lead electrical worker (crew foreman) is the person in charge at emergency response spill incidents for Line, Substation, Jackson Project, Transportation, and restoration incidents are listed below. When the person in charge leaves the site, the person to the right of the arrow assumes authority.

Line spills: Serviceman > Crew Foreman > Transformer man Substation spills: Substation Manager > Crew Foreman Restoration spills: Crew Lead > Equipment Operator Jackson Project spills: Powerhouse Superintendent > Appointed Designee Transportation spills: Crew Foreman > Transportation Spill Responder

BLOOD BORNE PATHOGENS

All employees with occupational exposure to blood borne pathogens (as identified in Exposure Determination in the District's Exposure Control Plan) will participate in a formal training program.

Any employee who, in the course of their job duties, contacts blood or blood byproducts must notify his/her supervisor. The employee will receive one-on-one counseling and information as defined in the District's Exposure Control Plan. This plan is available to employees on the Safety website (Safety Topics).

Most first-aid emergencies, create potentially infectious biological waste. Simply cleaning an open wound leaves exposed cleaning materials for disposal.

Treat all blood and bodily fluids as potentially infectious. If blood or other potentially infectious materials get on the skin, immediately wash with non⁻ abrasive soap and water. If the mucous membranes of the eyes, nose and mouth are exposed, immediately flush with running water at a sink or use eye wash and report the exposure to your supervisor.

In most minor first-aid emergencies, the volume of contaminated material will be very small. If you have received a small cut resulting in the need for a bandage or two, it is best if you clean your own wound. If you need assistance in bandaging, make sure the other person puts on protective gloves, found in the first aid kit. These isolated small amounts of potentially contaminated materials and gloves can be discarded in the regular trash wrapped up in paper towels or a small baggy, if available.

A major first-aid emergency with one or more severely injured individuals may generate a substantial amount of potentially contaminated waste. The 911 responders are responsible for the clean-up of materials or contaminated clothing at the site. If any contaminated material remains after the responders have left, (for example, carpet, machinery or tools) restrict access to the area until appropriate clean up can be performed by a qualified District employee.

The District has personnel trained and authorized in clean up. The departments are Maintenance Mechanics, Custodial, Jackson Project personnel and the Safety department.

Any contaminated clean-up material must be placed in a trash bag. Safety needs to be contacted for proper decontamination and/or disposal procedures.

HANTAVIRUS

Though still relatively rare, Hantavirus infection is a life-threatening illness found in many parts of the United States including Washington State. We can minimize the risk of becoming infected with this rodent-borne virus by taking proper precautions.

Background

Hantavirus Pulmonary Syndrome (HPS) is a disease caused by exposure to a virus carried primarily by the deer mouse. HPS results in an infection of the lungs.

Exposure

Hantavirus is spread from the deer mouse to people. The virus gets in the air as a mist from mouse urine and saliva or dust from feces. Breathing in the virus is the most common way to become infected; however, you can also become infected by touching your mouth or nose after handling contaminated materials. A rodent's bite can also spread the virus.

Hantavirus is not spread person to person. Being near someone who has HPS cannot infect you.

Preventing Hantavirus Disease

- Keep the workplace and home clean; store all food, water and garbage in metal or thick plastic containers with tight-fitting lids.
- Never leave pet food and water out overnight.
- Wash dishes and cooking utensils, and clean up spilled food immediately.
- Dispose of trash and clutter.
- When cleaning a rodent infested area, thoroughly wet and disinfect before you disturb rodent nests, burrows, or dens, which might create dust.
- Use spring-loaded traps and EPA-registered rodenticide such as bait pellets. Remember to keep baits and traps out of the reach of children and pets.

District Cleanup Procedures

If a professional exterminator is not available and feasible abatement is required by employees, the District recommends the following for safe disposal and cleanup of dead rodents, nests, and droppings:

- 1. Use PPE. Hantavirus can enter the body through the eyes; nose, and mouth. Employees are required to wear rubber gloves and goggles. You may want to use a disposable dust mask filter.
- 2. Thoroughly spray dead rodents, traps, droppings, nests and contaminated areas with a general household disinfectant such as Virex-tb or Steriphene (available in the Warehouse). Before removing any rodent habitat, make sure the area and nesting's are completely saturated with disinfectant in order to kill the virus. Wetting the area is essential in keeping the virus from becoming airborne. A 10 part water and one-part bleach mixture is also effective in killing the Hantavirus. Do not sweep or vacuum until the contaminated area is thoroughly wet.
- 3. Place disinfectant-soaked rodents and materials into a double plastic bag and dispose of in a covered garbage container.
- 4. Disinfect floors, shelves, countertops and other surfaces with a general household disinfectant such as a Virex-tb or Steriphene disinfectant (available in the Warehouse).
- 5. Before removing gloves, spray them with disinfectant then wash them in soap and water. Spray goggles or other eyewear with disinfectant and wash in soap and water. Discard gloves and the disposable dust mask (if worn) in a double plastic bag and dispose of in a covered garbage container. Thoroughly wash your hands with soap and water after removing and disinfecting gloves, goggles and HEPA respirator.

TOBACCO USE

Smoking is prohibited in District buildings, facilities, vehicles, and on District grounds unless otherwise designated.

Outside smoking areas used by employees are to be at least twenty-five (25) feet from entrances, exits, windows that open and ventilation intakes that serve an enclosed area where smoking is prohibited.

ALCOHOLIC BEVERAGES, NARCOTICS AND OTHER INTOXICANTS

There shall be no consumption of alcoholic beverages, narcotics or other intoxicants on District property or in District vehicles.

The use of alcoholic beverages, narcotics or other intoxicants shall not be allowed during working hours. Any employee taking prescription or over-the-counter medication that could impair his/her assigned work shall report this to his/her supervisor. (See *District Directive #34*, Employee Rules of Conduct).

HOUSEKEEPING

Work locations, vehicles and all work areas shall be kept clean and orderly at all times.

Combustible waste, such as oil-soaked rags, waste material and shavings shall be disposed of in approved metal containers with tight-fitting metal lids when inside buildings. Containers shall be emptied as soon as practical, but at least daily.

Combustible waste brought back from job sites on District vehicles shall be disposed of in designated trash receptacles at the end of that working shift.

Gasoline, if transported, must be in an approved container. Containers must not be in a closed compartment during transport.

When pumping gas into an approved can, the can must be placed on the ground before dispensing to prevent a static charge build-up. When transferring flammables from one container to another, both containers must be bonded and grounded.

All solvents shall be kept in approved, properly labeled containers. Chemicals with a flash point below 200 degrees F. shall be stored only in approved safety cans/cabinets.

Floors and platforms shall be free of dangerous projections or obstructions and maintained free from oil, grease, or water to prevent slipping hazards. Where the type of operations cause slippery conditions, mats, grates, cleats or other methods shall be used to reduce the hazard of slipping.

Stairways, aisles, permanent roadways, walkways, switchgear, breaker panels, firefighting equipment and material-storage areas in yards shall be kept clear and free from obstructions, depressions and debris.

Materials and supplies shall be stored in an orderly manner so as to prevent them from falling or spreading and to eliminate tripping and stumbling hazards.

All scrap lumber, waste materials and rubbish shall be removed from the immediate work area as the work progresses. All protruding nails shall be clinched or pulled.

ILLUMINATION

Whenever natural light is insufficient, illumination shall be provided in such an amount that continuing work operations, routine observations and the passage of employees can be carried out in a safe and healthful manner.

FIRE PROTECTION

Fire protection equipment shall be properly located and identified at all times. Except for actual use, employees shall not move or remove such equipment.

Except for portable extinguishers carried to a specific job, all fire extinguishers shall be mounted.

Portable fire extinguishers shall only be used by employees trained in the identification, selection and proper use. All other employees are expected to evacuate the building. Training shall be provided upon initial assignment and annually thereafter.

Portable fire extinguishers will be placed at a travel distance for employees of not more than seventyfive (75) feet.

All employees shall know the classes of fire, their burning characteristics and the proper type of fire extinguisher to be used.

The large majority of District-owned fire extinguishers are of the multipurpose dry chemical type marked "A-B-C" and can be used on any type of fire. Avoid breathing large quantities of the dry chemical.

Extinguishers shall be inspected at least monthly to determine that they are at assigned locations, that they are not obstructed and that they are in apparent working condition. Discrepancies shall be reported to the supervisor promptly. Fire extinguishers are also serviced annually and dated.

Employees shall not enter confined spaces after using CO_2 extinguishers until the area has been thoroughly ventilated. Jackson Project personnel are required to follow emergency evacuation procedures in case of CO_2 discharge.

HAND TOOLS

All tools, regardless of ownership, shall be of an approved type and maintained in good condition or removed from service. Tools are subject to inspection at any time.

Defective tools shall be tagged to prevent their use or removed from the job site.

Employees shall always use the proper tool for the job to be performed.

Makeshift and substitute tools shall not be used unless they have been approved and meet all requirements.

Hammers with metal handles, screwdrivers with metal continuing through the hand, and metallic measuring tapes shall not be used on or near energized electrical circuits or equipment.

Tools shall not be thrown from place to place or person to person. Tools must be raised or lowered from one elevation to another and shall be placed in tool buckets or firmly attached to hand lines.

Tools of such size that they can fall through grates or other openings shall never be placed unsecured on elevated places or uncovered gratings.

When impact tools such as chisels, punches, drift pins, etc., become mushroomed or cracked, they shall be properly dressed, repaired or replaced before further use.

Compressed air and compressed air tools shall be used with caution and only for the work for which they were intended.

PNEUMATIC TOOLS

Pneumatic tools shall never be pointed at another person.

Pneumatic power tools and hose sections must be secured by threaded couplings, quick-disconnect couplings, or by a one-hundred (100) pound tensile strength safety chain or equivalent across each connection to prevent the tools or hoses from becoming accidentally disconnected.

Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

When using a blowgun, the compressed air must be reduced to thirty (30) psi or less and only used with effective chip guarding and protective equipment.

Compressed air shall not be used to blow dust or dirt from clothing.

The manufacturer's safe operating pressure for hoses, pipes, valves, filters and other fittings shall not be exceeded.

The use of hoses for hoisting or lowering tools shall not be permitted.

All hoses exceeding one half (1/2) inch inside diameter shall have a safety device at the source of supply or branch line to stop airflow in case of hose failure.

Before making adjustments or changing air tools, unless equipped with quick-change connectors, the air shall be shut off at the air supply valve ahead of the hose. The hose shall be bled at the tool before breaking the connection. Only employees who have been instructed in their use shall operate pneumatic tools. Eye protection, foot protection and other necessary PPE shall be worn whenever operating pneumatic devices.

POWER OPERATED TOOLS

The non-current-carrying metal parts of portable electric tools such as drills, saws and grinders shall be effectively grounded when connected to a power source unless:

- The tool is an approved double insulated type, or
- The tool is connected to the power supply by means of an isolated transformer or other insulated power supply, such as a 24V DC system.

All powered tools shall be examined prior to use to ensure general serviceability and the presence of all applicable safety devices. The electric cord and electrical components shall be given an especially thorough examination.

Powered tools shall be used only within their capability and operated in accordance with the instructions of the manufacturer.

Tools connected to a central power supply including portable and vehicle-mounted generators that are not isolated or double insulated shall be protected by a Ground Fault Current Interrupter (GFCI) or an assured grounding system.

On construction sites where ground fault current interrupters are not utilized an assured equipment grounding conductor program must be utilized.

All tools shall be kept in good repair by a qualified person and shall be disconnected from the power source while repairs or adjustments are being made.

Electrical tools shall not be used where there is a hazard of flammable vapors, gases or explosive dusts.

Metal reinforced hose shall not be used on any District property or equipment where a reasonable possibility of electrical contact exists.

GRINDING WHEELS

Qualified persons shall be assigned to the mounting, care and inspection of grinding wheels and machinery. The grinding wheel operator shall be fully instructed in the use, care and protection of grinding wheels. (ANSI B7.1-2000).

Any grinding wheel thought to be unsafe shall be tagged and reported.

The wheel shall be visually inspected and ring tested to determine condition. If the wheel is found to be defective it shall be discarded.

If a grinding wheel is broken, a careful investigation shall be made to determine and correct the cause.

Under no circumstances shall a wheel be mounted on a machine on which the RPM exceeds the maximum safe RPM specified by the manufacturer. After mounting a wheel, care should be taken to see that the safety guards are properly positioned before starting the wheel.

The safety guard must cover the spindle end, nut and flange projections.

Blotters (compressed washers) shall be used between flanges and abrasive wheel surfaces. Abrasive wheels shall only be used on machines provided with safety guards. **EXCEPTION:** Portable grinding wheels two (2) inches or less and grinding inside of an internal unit.

All grinding wheels shall be run to operating speed with safety guards in place or in a protective enclosure before applying work, during which time no one shall stand in front of or in line with the wheel.

The work rest guard must be kept adjusted to within one-eighth (1/8) inch of the periphery of the wheel.

Wheels shall be rebalanced when and as often as is necessary. A qualified person shall balance unbalanced wheels. Wheels that cannot be balanced by truing or dressing shall be removed from the machine.

All grinders shall be equipped with protective glass guards for eye protection and approved eye protection must be worn.

Regardless of pressure required and regardless of their weight, size or shape, objects shall be ground only on the face, not on the side, of the wheel. **Exception:** Wheels designed for side grinding.

Tool rests must be adjusted to within one-eighth (1/8) inch of the grinding wheel.

MATERIAL LIFTING/CARRYING/HANDLING AND STORAGE

Before physically lifting objects, determine if it can be safely lifted. If not, assistance must be obtained.

There shall be a prearranged signal when two (2) or more persons handle an object that is to be lifted, lowered, moved or dropped.

When two (2) or more persons are carrying an object, each employee, if possible, should face the direction in which the object is being carried. It shall be determined in advance that there are no obstructions in the way.

Loads shall be carried in such a manner that vision is not obstructed.

All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapsing.

Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees.

Non-compatible materials shall be segregated in storage.

Bagged materials shall be stacked by stepping back the layers and cross keying the bags at least every ten (10) bags high.

Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.

Used lumber shall have all nails withdrawn before stacking. Lumber shall be stacked on level and solidly supported sills, not to exceed twenty (20) feet in height unless handled manually; then shall not be more than sixteen (16) feet high.

Structural steel, poles, pipe, bar stock and other cylindrical materials, unless racked, shall be stacked and blocked.

Following are the basic steps of safe lifting and handling.

- Size up the load and check overall conditions. Don't attempt the lift by yourself if the load appears too heavy or awkward. Check that there is enough space for movement and that footing is good. Good housekeeping ensures you won't trip or stumble over an obstacle. Inspect the area you are moving the object to and verify that you have a clear path.
- 2. Make certain that you have good balance. Your feet should be spaced wider than shoulder-width apart, with one foot beside and the other foot behind the object to be lifted.
- 3. Bend your knees; don't stoop. Keep your back straight, but not vertical. (There is a difference. Tucking in the chin straightens the back.)
- 4. Grip the load with your palms and fingers. The palm grip is more secure than your fingers alone. Tuck in your chin again to make certain your back is straight before starting to lift.
- 5. Use your body weight to start the load moving, then lift by pushing up with your legs. This makes full use of your strongest set of muscles.
- 6. Keep arms and elbows close to your body while lifting.
- 7. Carry the load close to your body. Don't twist your body while carrying the load. To change direction, shift your foot position and turn your whole body.
- 8. Watch where you are going!
- 9. To lower the object, bend your knees. Don't stoop. To deposit the load on a bench or shelf, place it on the edge and push it into position. Make sure your hands and feet are clear when placing the load.

Make it a habit to follow the above steps when lifting anything, even a relatively light object.

Team Lifting Must be Coordinated

If the weight, shape, or size of an object makes the job too much for one person, you must ask for assistance.

Ideally, workers should be of approximately the same size for team lifting. One individual needs to be responsible for control of the action to ensure proper coordination. If one worker lifts too soon, shifts the load, or lowers it improperly, either they or the person working with them may be injured.

Lifting Heavy Objects

Safe lifting of heavy items requires training and practice. For example, we've probably all seen a small person move heavy feed sacks with apparent ease. The secret lies in having the proper stance and grip. When equipment is available, it should be used to lift and carry heavy objects. Loaders, forklifts, hoists, etc. are made for this purpose.

FLAMMABLE/COMBUSTIBLE MATERIAL HANDLING AND STORAGE

Not more than sixty (60) gallons of Class I or Class II liquids, nor more than one-hundred and twenty (120) gallons of Class III liquids, may be stored in a storage cabinet.

Class I - includes those with flashpoints less than 100°F.

Class II - includes those with flashpoints at or above 100°F and less than 140°F.

Class III - includes those with flashpoints more than 140°F.

Storage cabinets shall be designed and constructed to meet the requirements of the ten (10) minute fire test.

No more than twenty-five (25) gallons of flammable or combustible liquids may be located outside of a storage cabinet inside a building, or in any one-fire area of a building.

Class I liquids shall not be dispensed into a container unless the nozzle and the container are effectively grounded.

COMPRESSED GASES

Cylinders shall have their contents properly identified.

Care shall be exercised in handling all compressed gas cylinders. Cylinders shall not be laid flat and rolled, or lifted by the valve or valve caps, nor dropped, jarred or exposed to extreme temperatures.

Acetylene cylinders shall be properly secured and always transported or stored in a vertical position.

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

Compressed gas cylinders, whether full or empty, shall be stored in an upright position and chained or otherwise secured so they cannot fall or be upset.

Cylinders shall have the valve cap or valve protection device in place at all times, except during actual use.

Empty cylinders shall have their valves closed.

Cylinders shall not be placed where they might accidentally become part of an electrical circuit, or within five (5) feet of an electrical outlet.

Inside buildings, cylinders shall be stored in well-protected, well-ventilated, dry locations, at least twenty (20) feet from highly combustible materials such as gas.

Employees shall never force connections that do not fit or tamper with safety relief devices or cylinder valves.

Special precautions shall be taken when using hydrogen to avoid the possibility of fire and explosion. **Danger - No Smoking** signs shall be posted where hydrogen is used or stored.

Hydrogen and fuel gas cylinders shall not be stored inside any operating building that is not of an approved design. Separate storage buildings or sheltered storage areas shall be used.

Oil, grease or similar materials shall not be allowed to come into contact with any valve, fitting, regulator or gauge of cylinders.

Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials (especially oil or grease) by a minimum distance of twenty (20) feet or by a five (5) foot high noncombustible barrier.

CUTTING AND WELDING

Only qualified persons shall use welding equipment.

Qualified maintenance personnel shall periodically inspect welding machines and inspection records shall be maintained. Electric welding machines shall be properly grounded prior to use.

Approved fire extinguishing equipment shall be readily available in the work areas. A fire watch shall be required whenever welding or cutting is performed in locations where other than a minor fire may develop.

If the object to be welded cannot be moved, a removable fire hazard in the vicinity shall be taken to a safe place.

Where combustible material is on the floor, such material shall be cleared for a radius of thirty-five (35) feet.

Before cutting or welding is permitted, the individual responsible for authorizing the welding or cutting activities shall inspect the area.

Adequate ventilation shall exist or job-approved respirators used while welding in confined spaces or while working on zinc, brass, bronze, stainless steel, galvanized or lead-coated materials.

Approved eye protection, gloves and clothing shall be worn during welding or cutting operations. Other employees shall not observe electric-welding operations unless they use approved eye protection. Welding screens shall be used, when feasible, whenever other persons may be exposed to the arc of the welding operation.

A torch shall not be lit with a match or from hot work.

When welding equipment is not in use, the cylinder valves shall be closed and the pressure released, or the power supply switch shall be opened.

Open flames must not be brought near to, nor shall welding or soldering be done on, any vessel which may have contained flammable or explosive substances until the vessel has been thoroughly purged by steam, or filled with an inert gas, water or otherwise handled by special safety procedures authorized by supervision.

Rules and instructions supplied by the manufacturer or affixed to the welding equipment shall be followed.

When electrode holders are to be left unattended, the electrodes shall be placed or protected so they cannot make electrical contact with employees or conducting objects.

Welding cables with damaged insulation or exposed bare conductors shall not be used.

Welding cables shall not have splices within ten (10) feet of the holder.

RESPIRATORY PROTECTION PROGRAM

Purpose

The District has determined that some of its employees are or can be exposed to hazards that require the use of a respirator in the performance of their work. This program is to ensure that these employees are properly trained and protected from the exposure to these hazards.

The primary goal of this program is to provide detailed instruction in the proper selection, use and maintenance of a respirator. The following are key points to the District's Respiratory Protection Program:

- A clear description of the hazards and the degree of protection required
- The selection of the respirator
- Medical evaluation for respirator users
- Fitting of the respirator
- The implementation of a maintenance program
- The written procedures covering routine, infrequent and/or emergency procedures
- The required training in the correct use and care of the respirator
- Respirator program evaluation

A complete copy of the District's Respiratory Protection Program can be found in the Safety Department.

Engineering controls such as ventilation and substitution of less toxic materials are the first line of defense. However, engineering controls have not always been feasible for some of our operations or have not always completely controlled the identified hazards. In these situations, respirators and other protective equipment must be used. Respirators are also utilized for protection during emergencies.

Scope and Application

This program applies to all employees required to wear respirators during normal work operations and during certain non-routine or emergency operations. Employees participating in the Respiratory Protection Program do so at no cost to the employee. The expense associated with medical evaluations, training, and respiratory protection equipment will be paid by the District.

The Program Administrator or designee must approve ALL District employee use of any type of respirator while at work.

Employees who voluntarily choose to use a cartridge-style respirator when the respirator is not required are subject to the medical evaluation, cleaning, and maintenance and storage elements of this program. These employees will also receive training covering proper procedures for cleaning, maintenance and storage of their respirators. In addition, the information specified in *Appendix A: Important Information about Voluntary Use of Respirators* will be provided to all voluntary users of respirators.

Employees who voluntarily choose to use a filtering face piece respirator (i.e., a dust-mask style respirator) are excluded from the requirements of this program.

Voluntary use does not require the District to pay for respirators, but program costs (e.g., medical evaluations when a cartridge-style respirator is used) are the responsibility of the District.

Responsibilities

Respirator Program Administrator

The Respirator Program Administrator is responsible for overseeing the Respiratory Protection Program and to conduct the required evaluations of program effectiveness to ensure that the requirements of this program are implemented. The Senior Manager of Safety or his/her designee is the program administrator.

Oversight of the program administrator includes:

- Identifying work areas, processes or tasks that require workers to wear respirators, and evaluating hazards
- Selection of respiratory protection options
- Monitoring respirator use to ensure respirators are used in accordance with their certifications
- Arranging for and/or conducting training
- Ensuring proper storage and maintenance of respiratory protection equipment
- Conducting qualitative/quantitative fit testing
- Administering the medical surveillance program
- Maintaining records required by the program
- Evaluating the program
- Updating the written program as necessary to reflect workplace changes that affect respirator use

Supervisors

Supervisors are responsible for ensuring that the Respiratory Protection Program is implemented in their area. In addition to being knowledgeable about the program requirements for their own protection, supervisors must also ensure the program is understood and followed by the employees under their charge. Duties of the supervisor include:

- Ensuring that employees under his/her supervision (including new hires) have received appropriate training, fit testing, and medical evaluation
- Ensuring the availability of appropriate respirators and accessories

- Being aware of tasks requiring the use of respiratory protection
- Enforcing the proper use of respiratory protection when necessary
- Ensuring that respirators are properly cleaned, maintained and stored according to the Respiratory Protection Plan
- Ensuring respirators fit well and do not cause discomfort
- Continually monitoring work areas and operations to identify changes in respiratory hazards
- Coordinating with the program administrator on how to address respiratory hazards or other concerns regarding the program

Employees

Each employee has the responsibility to wear his/her respirator when and where required and in the manner in which he/she was trained. Employees must also:

- Care for and maintain their respirators as instructed and store them in a clean and sanitary location
- Inform their supervisor if the respirator no longer fits well and request a new one that fits properly
- Inform their supervisor or program administrator of any respiratory hazards that they feel is not adequately addressed in the workplace and of any other concerns that they have regarding the program
- Notify their supervisor or the program administrator of any other problems associated with using their respirator

Respirator Selection

The program administrator is responsible to ensure that the respirator selected will be adequate to effectively reduce exposure to the respirator user under all conditions of use including reasonably foreseeable emergency situations.

Proper respirator selection involves choosing a device that provides protection from the respiratory hazards to which the worker may be exposed and permits him/her to perform with the least amount of physical burden.

Interchanging of respirator parts (e.g. cartridges or airline hoses) between different manufacturer's respirators or different respirators models made by the same manufacturer shall not be done without the program administrator or designee approval.

Evaluating Respiratory Hazards

The program administrator or designee will select respirators to be used on-site based on the hazards to which workers are exposed and in accordance with all WISHA standards. The program administrator will conduct a hazard evaluation for each operation, process, or work area where airborne contaminants may be present in routine operations or during an emergency.

Hazard Evaluation Update

The program administrator or designee is responsible to revise and update the hazard evaluation as needed (i.e., any time work process changes may affect employee exposure). If an employee feels that

respiratory protection is needed during a particular activity, he/she should contact his/her immediate supervisor who in turn will contact the program administrator. The program administrator will evaluate the potential hazard. The program administrator will then communicate the results of that assessment back to the affected employees.

Medical Evaluation

Employees assigned to tasks where respirators are utilized must be physically able to perform the work while using the respirator. Accordingly, the District has the responsibility of ensuring that employees are medically fit and able to tolerate the physical and psychological stress imposed by respirator use, as well as the physical stress originating from job and workplace conditions. Employees will not be allowed to wear respirators until a physician or other licensed health care professional (PLHCP) has determined that they are medically able to do so.

Any employee refusing the medical evaluation cannot work in an area requiring respirator use.

Employees voluntarily using filtering face piece respirators (dust masks) and employees using loose fitting escape-only respirators (provided that is the only respirator used) are exempt from the requirements of the medical evaluation program.

Medical Questionnaire Administration

Employees assigned to tasks requiring the use of respirators will be required to complete the "WISHA Respirator Medical Evaluation Questionnaire" (WAC 296-842). The program administrator or his/her designee will make available a copy of the questionnaire to all employees requiring medical evaluations. The written medical evaluation will be administered confidentially and during working hours at a place on site that is convenient to employees.

Physician or Licensed Health Care Professional's (PLHCP) Written Recommendations

The District will obtain a written recommendation from the PLHCP on whether or not the employee is medically able to wear a respirator. The recommendation must identify any limitations on the employee's use of the respirator, as well as the need for periodic or future medical evaluations that are required by the PLHCP.

Fit Testing

It has long been recognized that tight-fitting respirators must fit properly to provide their expected level of protection. To obtain adequate respiratory protection, there must be a proper match between the respirator seal and wearer's face. Respirators that don't seal properly around the face offer only the illusion of protection.

The primary purpose of fit testing is to identify the specific make, model, style, and size of respirator best suited for each employee. In addition, fit testing provides an opportunity to check on problems with respirator wearers and reinforces respirator training by having wearers review the proper methods of donning and wearing the respirator.

The Safety department will conduct fit testing. It has been determined that employee exposures will not exceed airborne concentrations in excess of ten (10) times the Permissible Exposure Limit (PLE),

therefore, qualitative fit tests can be conducted on all negative-pressure respirators. If conditions affecting exposure levels change, the program administrator will evaluate whether quantitative fit testing is required.

Corrective glasses, goggles or other personal protective equipment must be worn in such a way that the seal of the face piece is not negatively affected. Full-face-piece respirators will be provided where either corrective glasses or eye protection is required, since corrective lenses can be mounted inside a full-face respirator. The use of contact lenses with respirators where the wearer has successfully worn such lenses before will be allowed.

A user seal check (also known as a fit check) will be performed every time a tight-fitting respirator is put on or adjusted to ensure proper seating of the respirator to the face. The user seal check conducted must be either the positive and/or negative pressure checks described in WAC 296-842 User Seal Check Procedures or the manufacturer's recommended procedures when equally protective. The manufacturer's check procedure should be kept with respirator.

Employees who voluntarily chose to use air-purifying respirators are not required to be fit tested.

Maintenance and Care

The program administrator or their designee will oversee the maintenance and care of this program.

The standard requires that the District provide each respirator user with a respirator that is clean, sanitary, and in good working order. These requirements are a vital part of any successful respiratory protection program.

To ensure that the respirator remains serviceable and delivers effective protection, employees must be trained in the maintenance and care of the respirator.

Cleaning and Disinfecting

Respirators will be cleaned and disinfected as follows:

- Respirators issued for the exclusive use of an employee will be cleaned and disinfected as often as necessary to be maintained in a sanitary condition. Employees will be responsible to clean and disinfect respirators issued for their exclusive use.
- Respirators used by more than one employee will be cleaned and disinfected prior to being used by a different employee.
- Respirators maintained for emergency use as well as respirators used in fit testing and training will be cleaned and disinfected after each use.
- During fit-tests, disinfectant wipes can be used in between respirator wears to minimize the risk for spreading cold, influenza or other respiratory illness. **Note:** The person cleaning respirators with disinfectant wipes must be so trained. At the end of the day, each respirator will be completely disassembled and cleaned by immersion.
Storage

Respirators will be stored so that they are protected against damage, contamination, dust, sunlight, temperature extremes, excessive moisture, and damaging chemicals. When respirators are packed or stored, the face piece and exhalation valve will be stored in a manner that prevents deformation. Each respirator should be positioned so that it retains its natural configuration.

Inspection

Respirators used in routine situations will be inspected before each use and during cleaning.

To ensure continued reliability, respiratory equipment must be inspected on a regular basis. The frequency of inspection and the procedures to be followed depend on whether the respirator is intended for non-emergency, emergency, or escape use only.

Respirators designated for use in an emergency situation will be inspected at least monthly and in accordance with the manufacturer's instructions and checked for proper function before and after each use. Emergency escape-only respirators must be inspected before being carried into the workplace.

Repair

The program administrator or designee will ensure that respirators that fail to pass inspection or are otherwise found to be defective will be removed from service and repaired or adjusted properly. If a respirator cannot be repaired or adjusted, it will be discarded.

Repairs or adjustments to respirators will be done by an outside company. Only NIOSH-approved manufacturer's replacement parts designed for that respirator will be used. Repairs will be made in accordance with the manufacturer's recommendations and specifications regarding the type and extent of repairs to be performed.

Training and Information

Employee training is an important part of the Respiratory Protection Program and is essential for correct respirator use. The WISHA respiratory protection standard requires the District to provide training before the employee uses a respirator in the workplace. For the training to be effective, the training information must be comprehensive and presented in an understandable way.

Employees will demonstrate their understanding of the information covered in the training through hands-on exercises or a written test. The program administrator will document respirator training and the documentation will include the type, model, and size of respirator for which each employee has been trained and fit tested.

Frequency of Training

Annual training is necessary and appropriate to ensure that employees know about the Respiratory Protection Program and those that cooperate and actively participate in the program. Training and interaction with respirator instructors on at least an annual basis reinforces employee knowledge about the correct use of respirators and other pertinent elements of the Respiratory Protection Program. It also builds employee confidence when using respirators.

New employees will be provided respirator training prior to using a respirator in the workplace.

Employees will be **retrained annually** and more often as needed (e.g., if they change area/location/position and need to use a different respirator).

Retraining will occur if the program administrator or supervisor determines that any employee has not retained or demonstrated the knowledge, understanding, or skill level required by the District's training program.

ASBESTOS/CEMENT PIPE

The following procedures and training requirements have been adopted by the District and the Pacific Northwest Section of the American Water Works Association for working on asbestos-cement pipe.

These procedures have been shown to be effective in maintaining airborne fiber concentrations to levels below 0.1 fibers per cubic centimeter of air during work only on asbestos-cement water pipe. Although adherence to these procedures will minimize exposure to asbestos fibers, it remains the responsibility of the District to comply with all applicable federal, state, and local safety, health and environmental requirements when working with asbestos-cement pipe.

The minimum training requirements outlined below are considered essential to ensure that workers fully understand the hazards of asbestos-cement pipe and proper work practice procedures to follow when working with this material.

Carbide Blade Cutting (hand-operated only)

Blade cutters consist of a frame, adjustable to the circumference of the pipe, and a number of outboard, self-tracking rollers that align one or more carbide-tipped cutting blades. The cutter is rotated around the pipe with the blades cutting a groove into pipe. As the cutter is rotated, the blades are slowly tightened with screws to cut deeper and deeper into the pipe until the pipe is severed.

Snap Cutting

Snap cutting equipment operates by means of cutting wheels mounted on a chain wrapped around the asbestos-cement pipe. Hydraulic or manually applied pressure simultaneously squeezes the cutting wheels into the pipe wall until the pipe is severed.

Hand Saw Cutting

Large toothed, crosscut handsaws are used to manually cut small asbestos-cement pipes or to trim larger pieces.

Repair Band Installation

Repair bands consist of a pliable gasket material held in place by a metal sleeve tightened over the gasket and are used to repair small asbestos-cement pipe leaks.

Wet (Hot) Tapping

Wet tapping is done with specific equipment that can tap an asbestos-cement pipe while it is under pressure. The equipment is designed to tap various sizes of pipe and connect either services or pipe. Normally, the asbestos-cement debris is contained in the tapping equipment until removed by the operator.

To perform the above duties employees will need to:

- Wear PPE. Disposable coveralls, respiratory protection of 1/2 face respirator equipped with a HEPA filter (see *Respirator* section), rubber boots, hard hat and safety glasses.
- Excavate around the asbestos-cement pipe a sufficient distance to assure adequate tool clearance in the area to be cut. Care must be taken to avoid abrasion to the pipe. If excavation exceeds four (4) feet, refer to the trenching/shoring/excavation section.
- PPE must be worn and sufficient water must be available prior to entering a trench to begin cutting, repairing, and tapping operations.
- Clean and wash with water the surface of the pipe in the area to be cut, where the repair band will be installed, or the area to be tapped and attach the tapping equipment around the asbestos-cement pipe.
- In cutting operations, begin applying water to the area being cut and continue until the cutting process is complete.
- With repair band operations, install the repair band and tighten bolts, keeping the entire exposed area of the pipe wet in the vicinity of the repair band during the operation.
- With tap pipe, keep the entire exposed area of the pipe in the vicinity of the tap wet during the operation. Move to a new location and repeat the procedure above. Upon completion of the final tap, thoroughly wash the tapping equipment with clean water to remove all asbestos-cement debris. Allow wash water to drain into the bottom of the trench.
- Operate the cutting tool in accordance with the manufacturer's instructions until the cutting is complete. Make sure the water is applied in sufficient quantities to assure the area being cut is continuously wetted and no asbestos-cement dust is created.
- Upon completion of repair installation, thoroughly wash all tools with clean water to remove any asbestos-cement contamination and remove cleaned tools from the trench. Allow wash water to drain to the bottom of the trench.
- In wet (hot) tapping and repair band installation, install other pipe and fittings as necessary to complete the job, taking care to avoid any abrasions to the asbestos-cement pipe.
- Detach cutting equipment to move to a new location and repeat procedure described above. Upon completion of the final cut, thoroughly wash the cutting equipment with clean water to remove all asbestos-cement debris. Allow wash water to drain into the bottom of the trench. Remove washed cutting equipment from the trench.
- Complete any additional work within the trench, taking care to avoid any abrasions to the asbestoscement pipe.
- When pipe work is complete, thoroughly wash hands, boots, and small tools with clean water to remove all asbestos-cement debris. Allow wash water to drain into the bottom of the trench. Remove disposable coveralls, take all asbestos-cement pipe and asbestos-cement containing material and place in coveralls. Place these items into a plastic sealable bag and return it to the Water department for proper disposal at an approved landfill.
- Exit ditch in such a manner that no asbestos-cement debris will contaminate clothing, boots, tools, etc.

• Backfill trench.

Training

Initial formal classroom training includes federal, state and local laws, regulations, codes and standards. (Per the NWPPA A/C guidelines).

Identification of characteristics of types and health hazards.

Personal hygiene and prohibited practices.

Hands-on demonstrations, recordkeeping, knowledge test and certification.

ASBESTOS WORK REQUIREMENTS

The Scope and Application section in WAC 296-62, 65, 155 and 800, asbestos exposure in all work, includes, but not limited to, the following:

- Demolition or salvage of structures where asbestos is present
- Removal or encapsulation of materials containing asbestos
- Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof that contain asbestos
- Installation of products containing asbestos
- Asbestos spill/emergency cleanup
- Transportation, disposal, storage, containment of any housekeeping activities involving asbestos or products containing asbestos, on the site or location at which construction activities are performed
- Coverage under this standard will be based on the nature of the work operation involving asbestos exposure
- No work can be put out for bid and/or started by employees until it has been determined if the materials to be worked on contain asbestos. An accredited inspector must conduct an AHERA/good faith inspection unless the material is considered asbestos containing. Contact the Environmental Affairs department for assistance with AHERA/good faith inspections.

A complete copy of the District's Asbestos Work Requirements Program can be found in the Safety Department.

Asbestos

Asbestos is the name for a group of naturally occurring silicate minerals that can be separated into fibers. The fibers are strong, durable and resistant to heat and fire. They are also long, thin and flexible, so that they can even be woven into cloth.

There are several types of asbestos fibers, three of which have been used for commercial applications: (1) Chrysotile, or white asbestos, comes mainly from Canada, and has been very widely used in the US. It is white-gray in color and found in serpentine rock. (2) Amosite, or brown asbestos, comes from southern Africa. (3) Crocidolite, or blue asbestos, comes from southern Africa and Australia.

Types of ACM (Asbestos-Containing Material) or PACM (Presumed Asbestos-Containing Material) that may be present at District sites include things like:

- Roofing material
- Ceiling tiles
- Insulation
- Wallboard
- Vinyl & floor tiles/mastic
- Pipe insulation
- Substation control wiring
- Arc chutes on older 12kV circuit air breakers
- AC water pipe

Asbestos Exposure

Most health information on asbestos exposure has been derived from studies of workers who have been exposed to asbestos in the course of their occupation. Asbestos fiber concentrations for these workers were many times higher than those encountered by the general public.

Because asbestos fibers are naturally occurring and extremely aerodynamic, virtually everyone is exposed to asbestos. To be a significant health concern, asbestos fibers must be inhaled at high concentrations over an extended period of time. Asbestos fibers then accumulate in the lungs. As exposure increases, the risk of disease also increases.

Therefore, measures to minimize exposure and consequently minimize accumulation of fibers will reduce the risk of adverse health effects.

Asbestos is only dangerous if it becomes airborne. As long as asbestos-containing materials are not damaged, the asbestos fibers do not become airborne and do not pose a health threat to the building occupants. During an asbestos building survey, inspectors assess the condition of the asbestos-containing materials. The materials condition can deteriorate over time. If asbestos-containing material has been found damaged restrict access and contact the Safety department for an immediate hazard assessment.

Asbestos Diseases

As asbestos fibers accumulate in the lungs, several types of diseases may occur. **Asbestosis** is a scarring of the lung tissue. This scarring impairs the elasticity of the lung and hampers its ability to exchange gases. This leads to inadequate oxygen intake to the blood. Asbestosis restricts breathing, leading to decreased lung volume and increased resistance in the airways. It is a slowly progressive disease with a latency period of fifteen (15) to thirty (30) years.

The next type of disease attributed to asbestos exposure is **Mesothelioma.** It is a cancer of the pleural lining and considered to be exclusively related to asbestos exposure. By the time it is diagnosed, it is

almost always fatal. Similar to other asbestos-related diseases, mesothelioma has a latency period of thirty (30) to forty (40) years.

Lung cancer is a malignant tumor of the bronchi covering. The tumor grows through surrounding tissue, invading and often obstructing air passages. The time between exposure to asbestos and the occurrences of lung cancer is twenty (20) to thirty (30) years. It should be noted that there is a synergistic effect between smoking and asbestos exposure that creates an extreme susceptibility to lung cancer.

Signs and Labels

Signs shall be posted at the entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which contain TSI and surfacing ACM/PACM.

The signs must identify the material that is present, its location, and appropriate work practices that will ensure that the ACM/PACM will not be disturbed.

Previously installed PACM/ACM that is identified must be labeled in areas where the label will clearly be noticed. Posting of signs may be used as an alternative to labels.

Labeling Requirements

DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD AVOID BREATHING AIRBORNE ASBESTOS FIBERS

Competent Person

An asbestos competent person means one who has the required training necessary to be capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate them. The District has one asbestos supervisor that meets this requirement in the Substation department.

Duties

The competent person must make frequent and regular inspections of the job site, materials and equipment. The competent person must make an initial exposure assessment before or at the initiation of all covered operations to determine expected exposures. This assessment shall be documented in writing, with copies furnished to the Safety department. On job sites where class II work is being performed, the competent person must perform or supervise the following duties:

- Set up of the regulated area, enclosure, or other containment
- Ensure (by on-site inspection) the integrity of the enclosure or containment
- Set up procedures to control entry to and exit from the enclosure and/or area
- Ensure, through on-site supervision that employees set up and remove engineering controls, use appropriate work practices and personal protective equipment in compliance with all requirements
- Ensure that employees use the hygiene facilities and observe the decontamination procedures

- Ensure through on-site inspection that engineering controls are functioning properly and proper work practices are being used
- Ensure that notification requirements are met
- Supervise all employees exposure monitoring
- Ensure that employees working within the enclosure and/or using glove bags wear protective clothing and respirators when needed

Training

- 1. Any employee whose duties may bring him/her in contact with asbestos-containing materials is required to have annual asbestos awareness training, which is a two (2) hour class (WISHA) references these workers as "Class IV".
- 2. Substation Wireman that work on asbestos-containing control wire, arc chutes and associated parts are required to complete a nine (9) hour training class with an annual refresher. Water workers who work on ACM water pipe are required to complete an eight (8) hour training class with an annual refresher.
- 3. Additional craft training requirements will vary, depending on duties, potential exposure, etc. Employees involved in any abatement (removal) of asbestos-containing materials require special training. The Safety department must be contacted to help assess the exposure and training requirements for any new work that has not already been approved.
- 4. Supervisors/Foreman who supervise crafts involved in asbestos work must attend the same training as the employees they supervise.

Asbestos certified supervisors are required to attend a forty (40) hour training class and an eight (8) hour annual refresher class.

Methods of Compliance

Some methods of compliance apply to all covered asbestos jobs. Others are class-specific.

Requirements Applying to All Jobs

Controls and practices that must always be used, regardless of the level of exposures, are:

- 1. Vacuum cleaners with HEPA filters to collect asbestos-containing debris and dust
- 2. Wet methods or wetting agents during handling, mixing, removal, cutting, application and cleanup (unless infeasible or creates a greater hazard)
- 3. Prompt clean up and disposal of wastes and debris contaminated with asbestos in leak-tight containers

Controls and work practices that shall not be used, regardless of the level of exposure, are:

- 1. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air
- 2. Compressed air to remove asbestos-containing materials, unless used in conjunction with an enclosed ventilation system to capture the dust cloud

- 3. Dry sweeping, shoveling or other dry clean-up of dust and debris containing ACM and PACM
- 4. Employee rotation to reduce employee exposure

Work Procedures

All work shall be performed using methods to minimize the disturbance of asbestos-containing material (ACM). The following procedures must be followed when working with the asbestos-containing wire insulation.

Each department will establish individual work procedures if working on asbestos-containing material. **The Safety department must approve all work procedures before the procedure is used.** Employees must attend the necessary training before they are asked to perform the work.

Controls shall be used that will reduce employee exposures to the lowest possible concentration. The work practices and procedures in place are minimum requirements and additional safeguards that exceed these may be used. Contact the Safety department or an asbestos competent person for additional guidance.

A. Regulated Areas

Prior to the start of work, the area shall be regulated. A regulated area is an area established by the District where Class II or III work is performed where debris and waste from asbestos work is likely to accumulate. In order to regulate an area, access must be restricted and the area demarcated to prevent access from unauthorized personnel. Warning signs shall be posted at all approaches to the regulated areas. The signs shall bear the following information: **If respiratory equipment is required, a sign with that additional information is required.**

DANGER ASBESTOS CANCER AND LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY

Access to the regulated area shall be restricted to authorized persons. No eating, smoking, chewing tobacco or gum, or applying cosmetics will be allowed in the regulated area. The regulated area shall be cordoned off with warning tape to ensure that no unauthorized personnel enter the regulated area.

FIBER OPTIC AND RADIO FREQUENCY COMMUNICATION SYSTEM HAZARDS AND SAFE WORK PRACTICES (UPDATED 5/14/2009)

The District shall ensure employees working on or around these types of communication systems have the necessary training to be protected from the associated hazards.

Fiber-Optic Communication System Hazards

1. Infrared light - Eye injuries may be caused if a worker's eye is exposed to non-visible infrared light. This can occur when a cable's outer cover has been damaged and the glass fibers that carry communication information are exposed. Never look directly into the exposed area. Cover the damaged area with electrical tape to block the infrared light.

2. Glass fiber slivers - Injury can occur if small invisible slivers of glass fiber come into contact with a worker's body. This exposure can occur during installation or repair of exposed glass fiber. Ingestion of these fibers poses the greatest hazard and may cause internal bleeding. To prevent injury and reduce exposure, wear disposable latex gloves, safety glasses, and wash hands when finished. For workers who will be splicing glass fiber, the work area should be set up to the catch falling fibers so they can be disposed of to protect others.

Radio Frequency (RF) Communication System Radiation Hazards

When an employee works in an area where they have radio-frequency (RF) exposure, the District shall institute measures that ensure the employee's exposure is not greater than that permitted.

Employees who work on or around communication systems must have training based on their potential exposure.

Radiation from RF is a form of non-ionizing radiation. Unlike radiation from x-rays and radioactive elements--which are ionizing sources and can alter molecular structure--RF fields cause heating effects in tissue. The danger from such sources occurs when the RF fields cause heating in excess of the body's natural ability to cool itself. Thus, low levels of RF exposure are not likely to cause harm. Investigation at medical research facilities has sought to determine the lowest levels of RF at which the observable biological effects begin to occur, whether harmful or not. These investigations have led to the establishment of national safety standards for workers and the general public.

Although much has been learned in the past 20-plus years, research continues worldwide in the area of RF safety. National standards and guidelines for human exposure to RF sources are based upon what is known today, and are subject to change should new information become available. The standards incorporate a substantial margin for safety to allow for uncertainties, variations among individuals and environmental variations.

Because most cellular and other wireless service antennas on towers operate at relatively low power levels, RF fields in the vicinity of such antennas are of low intensity and individuals may continuously remain three (3) feet or more from most operating antennas without concern. Safety rules have established three (3) feet as the Minimum Safe Working Distance (MSWD) from operating antennas, unless the antenna is marked with signage stating otherwise. Short term exposures at less than the MSWD are permissible, provided the period of exposure within the MSWD does not exceed six (6) minutes in a fifteen (15) minute period.

The MSWD is determined by Telecommunication Engineers for each transmitting antenna on a tower prior to installation. In most cases, this will be three (3) feet. In the rare instance that the MSWD is greater than three (3) feet, appropriate warning signs indicating the MSDW will be installed.

Where a worker must remain within the MSWD for more than six (6) minutes, the antenna(s) shall be turned off. A District representative coordinates the request to turn off the antenna(s) for worker protection. The District may have to depend on others, such as wireless clients, to turn off the antennas when requested.

Procedures for Installation and Performing Service Work in and Around Wireless Antennas

When employees are assigned jobs requiring work within six (6) feet of the front of a wireless antenna, high RF radiation levels may occur. Very little RF radiation occurs at the back of the antennas. Radiation from wireless transmitters is the heating kind (like a microwave oven) and does not accumulative like nuclear radiation. Once you leave a wireless transmitter area, your body dissipates the heat.

The federal government and International Institute of Electrical and Electronics Engineers (IEEE) have established standards to protect workers. The District purchased RF radiation detectors to inform workers if they are in an RF field, what level of RF energy is reaching them, and when they need to move to a safer area.

Note: Work done by the Line Department on communication antenna equipment will be done with all antenna RF systems turned off.

Before performing work in and around towers or poles with mounted wireless antennas, follow these procedures:

- 1. Prior to starting, ensure one (1) member of the crew has checked out the number of Nardalert radiation detectors needed from the Tool Room. Follow the instruction manual for proper operation.
- 2. Upon arrival at the job site, remove the unit from its yellow box and look at the bottom of the unit for two (2) small switches. One is marked "O" and "I". Place the switch in the "I" position to turn on the device. Place the other switch to the marking identified by this symbol "<". This will turn on the audio alarm mode.
- 3. For the first ten (10) seconds of operation, lights and sounds will indicate the unit is self-testing. When only one (1) green light flashes every eight (8) to ten (10) seconds, the self-test is complete and the unit is ready to use.
- 4. Wear the unit on your chest pocket with the proper side facing out and move into the work area. Do not cover the meter with clothing. Move the meter through the entire work area in which any part of your body could be exposed facing the antenna. Because part of your body could be in the field and part out, the device(s) can also be tied on the front of each antenna during the job. The audible alarm will sound to warn employees during the job that the antenna(s) have come back on. The District has six (6) Nardalert devices.

Note: Transmitting on a 900 MHz portable radio can turn on the additional lights on the device. To ensure the antenna is off, don't use the 900 MHz radio when testing for RF from the antenna.

- If you hear a tone from the unit, look at the light display. As long as the lights indicate 100 OR BELOW, you are in a safe area and may continue with your work (See note above for Line Department employees).
- If the unit alarms sounds and lights indicate OVER 100, you are in a radiation area and HAVE UP TO THREE (3) MINUTES TO MOVE OUT. Immediately move safely to a location where the unit

indicates **100 OR LESS**. Moving three (3) or more feet away from the antenna will reduce your exposure. *See page 22 of the Nardalert instruction manual, located in the yellow box, for a description of the alarms*.

- 7. District employees shall not work in areas with RF exposures where the detector indicates a reading of more than 100 without the antenna being turned off.
- 8. Please turn the unit off by placing the switch in the "O" position and return to the Tool Room when you are finished.

Responding to an Emergency Where the Pole Supporting the Antenna is damaged and Needs to be Replaced

- 1. The qualified worker first on the scene reports the problem to ECC and requests that they call the National Operations Center (NOC) emergency number of the owner of the antenna(s) to have it turned off.
- 2. If the coaxial cable at the antenna base is cut, it may still be emitting an RF signal. Stay at least three (3) feet away from the exposed cable until the site has been turned off.
- 3. Follow the above procedure for using the Nardalert device to verify the site has been turned off.

LEAD EXPOSURE

The purpose of this standard is to provide proper training, equipment and procedures for maintaining the health and safety of employees working with lead and lead-containing materials. This section on lead applies to all work where an employee may be occupationally exposed to lead. Tasks covered by this standard include the following processes and operations:

- Demolition or salvage of structures where lead may be present
- Application, or removal and encapsulation of material or coatings containing lead
- New construction, alteration, repair or renovation of structures, or substrates, that contain lead, or material containing lead
- Installation of products containing lead
- Lead contamination/emergency cleanup
- Transportation, disposal, or containment of lead or materials containing lead on the site or location at which construction activities are performed
- Maintenance operations associated with lead-containing materials
- Welding, soldering, cutting, burning, grinding, sanding and abrasive blasting involving lead coatings and materials

A complete copy of the District's Lead Exposure Program can be found in the Safety department.

Methods of Compliance

The District shall implement engineering and work-practice controls, including administrative controls, to reduce and maintain employee exposure to lead at or below the permissible exposure level to the extent that such controls are feasible. Whenever all feasible engineering and work practice controls that

can be instituted are not sufficient to reduce employee exposure at or below the permissible exposure limit, the District shall nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them by the use of respiratory protection.

When respiratory protection is required, the District shall provide respirators at no cost to employees, and assure the proper fit, training, and use. (See *Respiratory* Section.)

When respirators are used to limit employee exposure and all the respirator requirements have been met, employee exposure may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the daily TWA exposure.

Employee Information and Training

For all employees who are subjected to lead at or above the action level on any day or who are subject to exposure of lead compounds which may cause skin and/or eye irritation, the District shall provide a training program and ensure employee participation.

The District shall provide the training program as initial training prior to the time of job assignments. The District shall also provide the training program at least annually for each employee who is subject to lead exposure at or above the action level on any day.

The District shall assure that each employee is trained in the following:

- Lead health hazard information. (See Safety department.)
- The specific nature of the operations which could result in exposure to lead above the action level
- The purpose, proper selection, fitting, use and limitations of respirators

The purpose and a description of the medical surveillance plan, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead, with particular attention to the adverse reproduction effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant.

The engineering controls and work practices associated with the employee's job assignment, including training of employees to follow relevant good work practices.

The contents of any compliance plan in effect.

Instructions to employees that cleaning agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and the employee's right to access the records.

SIGNS

The District shall post the following warning signs in each work area where employee exposure to lead is above the PEL.

WARNING LEAD WORK AREA POISON NO SMOKING OR EATING

POWDER ACTUATED TOOLS

Only qualified operators shall operate powder actuated tools. Tools shall be operated in strict accordance with the manufacturer's instructions. Tools that use brass or nickel casings require formal certification by an authorized licensed instructor.

Eye and/or face protection shall be worn by operators, assistants and adjacent personnel when the tool is used. Hearing protection shall be used when making fastenings in confined space. Refer to *General Safety Rules* section for specifics.

Each powder actuated tool shall be stored in a lockable container bearing the words For Qualified Operators Only, According To Manufacturer's Instructions Powder Actuated Tool.

The tool shall be tested each day to see that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedures.

Brass or nickel cased powder loads shall be coded to identify the powder load levels by case color and powder load color as specified in Table G.

		Normal Velocity			
Power	Color Identification		Meters	Feet	
Level	Case Color	Load Color	Per Second	Per Second	
1	Brass	Gray	91	300	
2	Brass	Brown	119	390	
3	Brass	Green	146	480	
4	Brass	Yellow	174	570	
5	Brass	Red	201	660	
6	Brass	Purple	229	750	
7	Nickel	Gray	283	840	
8	Nickel	Brown	283	930	
9	Nickel	Green	311	1020	
10	Nickel	Yellow	338	1110	
11	Nickel	Red	366	1200	
12	Nickel	Purple	393	1290	

TABLE G Power Load Identification

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Any tool found not in proper working order, or that develops a defect during use, shall be immediately removed from service and not used until properly repaired.

Prior to use, the operator shall ensure that all protective devices are in place and in working order. A warning sign, at least 8"x 10", having bold face type at least 1" high, shall be posted on all construction sites where powder actuated tools are used.

Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any employee. Hands shall be kept clear of the open barrel end.

In the event of a misfire, the operator shall hold the tool firmly against the work surface for a period of thirty (30) seconds and then follow the explicit instructions set forth in the manufacturer's instructions.

These tools shall not be used in explosive or flammable atmospheres.

Fasteners shall not be driven into very hard or brittle materials including, but not limited to: Cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick or hollow tile.

Driving into easily penetrated materials shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.

Only cartridges with an explosive charge adequate for the job and proper penetration shall be used.

Tools and cartridges shall never be left unattended in the work area and should be stored in a secure room, cabinet or box when not in use.

SCAFFOLDS AND SAFE SUPPORTS

Scaffolds shall be erected, moved, dismantled or altered only under the supervision of a competent person. Scaffold planks shall extend over their end supports (bearers) at least six (6) inches but not more than twelve (12) inches. Platforms shall be level, and have a minimum width of two 2"x 10" planks or a minimum of eighteen (18) inches.

No employee, or any material or equipment, shall be supported by any portion of a tree, pole structure, scaffolding, aerial equipment, etc., without it first being inspected or otherwise determined such support is adequately strong and properly secured in place.

The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose bricks, or concrete blocks shall not be used to support scaffolds or planks.

Employees shall not use a scaffold over ten (10) feet in height unless a standard guardrail with mid-rail and toe board are installed on all open sides and ends of the platform.

The height of freestanding scaffold towers shall not exceed four (4) times the minimum base dimension.

Where persons are required to work or pass under the scaffold, scaffolds shall be provided with a screen between the toe board and the guardrail, extending along the entire opening.

Scaffolds and their components shall be capable of supporting, without failure, at least four (4) times the maximum intended load.

Wire, synthetic or fiber rope used to suspend scaffolding shall be capable of supporting six (6) times the intended weights (rated load).

Employees shall use an access ladder or equivalent safe means to gain access.

Scaffold planks shall extend over end supporters not less than twelve (12) inches.

No welding, burning, riveting, or open flame work shall be performed on any staging suspended by means of fiber or synthetic rope.

BATTERIES

Eye protection devices that provide side, as well as frontal eye protection, shall be provided to and worn by employees when measuring storage-battery-specific gravity or handling electrolytic.

Acid-resistant gloves and aprons shall be worn by employees for protection against spattering while handling batteries.

Facilities for quick drenching or flushing of the eyes shall be provided unless the storage batteries are of the enclosed type and equipped with explosion-proof vents, in which case sealed rinse water or neutralizing packs may be substituted for the quick drenching or flushing facilities.

All types of batteries shall be returned to the Warehouse for proper disposal.

SEWAGE CONTAMINATION INCIDENTS, SAFE WORK PRACTICE GUIDELINES

Purpose

The following safe work practices have been established for District employees to utilize when suspected sewage contamination is discovered on or around District equipment.

Overview

Sewage contamination should be suspected when any sewage odor or visual signs are observed. It's important to note, however, that low levels of sewage contamination may not produce an odor or visual signs and could be found on or around any equipment. Contact exposure to sewage can cause possible health effects. As a result, for minimum protection employees should always use gloves and good hygiene practices by washing their hands with soap and water during and after the job, before eating, smoking, or doing other activities that might provide potential exposure.

Sewage and contaminated equipment can be rapidly and effectively cleaned following removal of the suspect sewage and decontamination using a solution of 10 parts water to one-part bleach and a source of clean water to wash it down. The District has access to several sewage disposal contractors who will provide this service. Several personal hygiene steps must be observed when sewage contamination is suspected. This response procedure shall be followed for employee safety.

If an employee believes they have been exposed to sewage, he/she should follow the good hygiene practices stated above and report the incident to their supervisor and the Safety Department.

Non-Emergency Incident

- 1. Employee-in-charge at the site stops work and reports findings to supervisor.
- 2. Supervisor determines if work can be postponed.
- 3. If work can be postponed, the supervisor/customer service designer/engineer in charge of the work will contact the Health Department at 425-339-5250 and make arrangements to meet on site with a District employee that can assist the Health Department representative.

- 4. Supervisor contacts Safety Department and briefs them of the situation.
- 5. Health Department investigates and takes necessary action with the customer to fix any sewage related problems.
- 6. Supervisor/customer service designer/engineer will work with Health Department to determine if District employees are needed to assist in cleanup. If employees are needed, they will follow the guidelines below.
- 7. After being informed by the Health Department that the problem is resolved, the supervisor/customer service designer/engineer, will contact Safety to review the issue to determine when or how work can resume. Safety will contact the Health Department at 425-339-5250 to receive a written copy of the outcome.

Emergency (Normal Work Hours) Incident

- 1. Employee-in-charge stops work and reports findings to supervisor.
- 2. Employee-in-charge at the site determines equipment access needs and whether work can successfully proceed by utilizing a sewage disposal service and then notifies Crew Dispatch. Crew Dispatch will call one of the listed disposal service companies. If it's determined the sewage disposal company cannot meet our schedule, Crew Dispatch will contact the area supervisor who will determine whether the work should be postponed until the service company can be on site. If it's determined the work cannot be postponed, the supervisor will contact Safety for assistance.
- 3. Crew dispatcher calls one of the sewage disposal companies on the list and sets a time when they can meet with the District crew on site to perform the work.
- 4. Supervisor contacts the Health Department at 425-339-5250 and makes arrangements for them to meet the crew on site if possible. Health Department representative can take a sample if needed.
- 5. Supervisor contacts Safety department and briefs them of the situation.
- 6. Employee-in-charge meets on site with the sewage Disposal Company and Health Department representative, if available, and takes the necessary steps on the electrical system to make the site safe. This includes a review of safety precautions with the sewage company representative before allowing pumping and decontamination work on or around District equipment.
- 7. After the site has been cleaned and decontaminated, crew members can proceed with work on the equipment after donning disposable rain gear, gloves, boots, and safety glasses for extra protection.
- 8. When work is completed, crew removes and disposes of all protective gear in a plastic bag and places it in main garbage container outside.
- 9. After removing protective gear, employees shall wash their hands with soap and water. Employees shall also wash hands with soap and water any time during the job before eating, smoking, or doing other things that might provide potential exposure.
- 10. Health Department investigates and directs the customer to fix any sewage-related problems.

11. After being informed by the Health Department that the problem is resolved, the Supervisor/Customer Service Designer/Engineer will contact Safety to review the issue to determine when or how work can resume. Safety will contact Kevin Plemel at the Health Department at 425-339-5250 to receive a written copy of the outcome.

Emergency (After Normal Work Hours) Incident

- 1. Employee-in-charge stops work and reports findings to ECC.
- 2. Employee-in-charge at the site determines equipment access needs and whether work can successfully proceed by utilizing a sewage disposal service and contacts ECC to request that they call one of the listed disposal service companies and set up a time to meet with the crew. If it's determined that the sewage disposal company cannot meet our schedule, ECC will contact the area supervisor. The area supervisor will make the determination on whether the work should be postponed until the service company can be on site. If it's determined that the work cannot be postponed, the supervisor will contact the Safety department for assistance.
- 3. ECC contacts one of the sewage disposal companies on the list and sets a time when they can meet on site with the District crew to perform the work.
- 4. Employee-in-charge meets on site with the sewage company representative and takes necessary steps on the electrical system to make the site safe. They also review safety precautions with the sewage company representative before they work on or around the equipment.
- 5. After the site has been cleaned and decontaminated, the crew members may proceed with work on equipment after donning disposable rain gear, gloves, boots, and safety glasses for extra protection.
- 6. When work is completed, crew removes and disposes of all protective gear in a plastic bag and places it in main garbage container outside.
- 7. After removing the protective gear, employees shall wash their hands with soap and water. Employees shall also wash hands with soap and water any time during the job before eating, smoking or doing other things that might provide potential exposure.
- 8. Employee-in-charge notifies supervisor the next business day. Supervisor contacts the Health Department at 425-339-5250 and provides information necessary for Health Department to investigate and direct the customer to fix any sewage-related problems.
- 9. The supervisor contacts Safety department and briefs them of the situation.
- After being informed by the Health Department that the problem is resolved, the supervisor/customer service designer/engineer will contact Safety to review the issue to determine when or how work can resume. Safety will contact Kevin Plemel at the Health Department at 425-339-5250 to receive a written copy of the outcome.

Proper Sewage Cleanup Procedures

Purpose

To establish minimum performance requirements for employees who respond to spills involving raw sewage. To ensure proper clean-up procedures and personal protective procedures are followed throughout the response effort and to protect employees, the public, and the environment from the potential harmful effects of chemical and/or pathogenic exposure associated with sewage spills and remediation efforts.

Responsibilities

Safety Department - shall be responsible for providing the following required response training: 1) hazardous materials communication and application to sewage spill cleanup; 2) Confined space entry. **Facilities Management** - Facilities personnel are primary responders to sewage spills. Responsibilities include proper cleanup and disposal of spilled sewage.

Supervisors - Facilities supervisors shall be responsible for ensuring response personnel are trained prior to engaging in sewage spill cleanup efforts, and for ensuring the sewage spill cleanup efforts are done in accordance with District procedures.

Health Hazards of Sewage

Pathogens and Diseases - numerous disease-causing agents are potentially present in raw sewage. These organisms include amoebas, protozoa, bacteria, viruses, mold spores, etc. In the United States, most illnesses associated with raw sewage exposure produce mild to severe flu-like or cold-like symptoms. However, more serious illnesses such as hepatitis can be contracted through contact with raw sewage. Since microorganisms can cause diseases by entering the body through the mouth, eyes, ears, nose, or through cuts and abrasions to the skin, care should be taken and appropriate personal protective equipment (PPE) utilized when the potential for direct contact with raw sewage is possible.

Note: Whenever possible, digital photos should be taken of the area before and after cleanup.

Good Hygiene

- Do not touch fecal matter or raw sewage with bare hands. If you need to remove it, wear waterproof gloves and use an instrument such as a tongs or spade to pick up matter.
- Do not smoke, eat, drink, apply lip treatment or chew gum while cleaning up fecal matter or raw sewage.
- Reduce exposure by keeping those not properly protected from coming in contact with the material.
- Clean everything, including clothing, tools, and footwear that come into contact with fecal matter or raw sewage. Use a solution of ten parts water to one-part household bleach to wash down contaminated surfaces and clean equipment.
- Wash your hands thoroughly even if you were wearing gloves during potential exposure. Use plenty of soap, scrub for at least thirty (30) seconds and rinse thoroughly with warm water. The Washington Department of Health and Human Services states that frequent, routine hand washing is the most important safeguard in preventing infection by agents present in sewage.

Warning! Never mix bleach and ammonia cleaning products for any cleaning job. Ammonia and bleach mixed together form a poisonous gas.

Exposure and First Aid

If you believe raw sewage has come into direct contact with your eyes, mouth, ears, nose, or a cut, abrasion, puncture, etc. immediately and thoroughly wash the exposed area with plentiful amounts of soap and water. If an employee believes they have been exposed to sewage, they should follow the good hygiene practices stated above and report the incident to the supervisor and the Safety department.

Personal Protective Equipment (PPE) and Clean-Up Equipment

As appropriate, use the following equipment when cleaning up fecal matter or raw sewage spills:

- Neoprene gloves, long-sleeved shirts/pants, rubber boots
- N100 or HEPA face shields
- Safety glasses/goggles
- Disposable rain gear
- HEPA wet/dry vacuum, fans/blowers
- Hudson sprayers
- Shovels, mops, buckets, tongs

Clean-Up Procedure

- 1. Secure the overflow area to prevent contact by unauthorized personnel until the site has been thoroughly cleaned.
- 2. Investigate the potential for electrical hazards and de-energized electrical circuits as necessary.
- 3. Prepare solution using ten parts water to one-part household bleach in buckets and/or Hudson sprayers, in accordance with the manufacturer's directions.
- 4. Put on all appropriate PPE; rubber boots, rubber gloves, long sleeved shirt, long pants (no shorts), safety goggles, half mask.
- 5. Remove all furniture, loose rugs, appliances and equipment if possible from the area.
- 6. Furniture, loose rugs and drapery should be professionally cleaned.
- 7. Saturated wall-to-wall carpeting usually cannot be adequately cleaned. It should be removed, wrapped in plastic and taken to a transfer station or sanitary landfill.
- 8. All surface areas such as linoleum/hardwood floors, concrete, wood molding, wood and metal furniture, etc., should be thoroughly cleaned with hot water and a solution of ten parts water to one-part household bleach. Let the surface air dry.
- 9. Remove and replace plaster, plasterboard, and lath that have been saturated and are soft to the touch. If the surface has only been wetted, clean as you would a hard surface, but do not saturate the plaster.
- 10. Clean sinks, rinse basins, and/or other plumbing fixtures that have had sewage backup with a solution of ten parts water to one-part household bleach.

- 11. Where practical, thoroughly flush the areas clean of any sewage or wash-down water. Solids and debris are to be flushed, swept, picked-up and transported for proper disposal.
- 12. If inside a building, increase air circulation or adjust HVAC system to reduce odors and mold growth. Open all windows and doors. Run a dehumidifier and use fans and heaters to speed the drying process.
- 13. Following complete clean-up of the contaminated areas, wash your hands thoroughly and enclose all protective gear in a plastic bag and dispose of in main garbage container outside. Disinfect clean-up mops, brooms, shovels, tongs, brushes, etc. with a solution of ten parts water to one-part household bleach.
- 14. Employees shall also wash hands with soap and water any time during the job before eating, smoking or during any activity that may provide potential exposure.

Warning! Never mix bleach and ammonia cleaning products for any cleaning job. Ammonia and bleach mixed together form a poisonous gas.

If Sewage Disposal Service is Not Available

Procedure for performing the work when a sewage disposal service is not available and the work must be done.

- 1. Determine value of material to be removed. For small amounts, six (6) barrels or less, use 55 gallon barrels found in the Warehouse. The Tool Room will have the necessary pump and hoses to pump material into the barrels. The vac truck can be used to supply water to clean the equipment after decontamination. For larger amounts, the vac truck will be used to remove the material.
- 2. Before proceeding with the work, all crew members exposed to the material will put on disposable rain gear, gloves, boots, and safety glasses for protection. These are available in the Warehouse.
- 3. For decontamination, the Tool Room will have a spray can and bleach. A solution of ten parts water to one-part bleach will be mixed on site and used to spray on contaminated equipment. After spraying on the solution wait about fifteen (15) minutes, then wash it off with clean water and then pump it into a barrel or vac truck.
- 4. Employees will continue to wear protective equipment after decontamination until work is completed for extra protection.
- 5. When work is completed, crew removes and disposes of all protective gear in a plastic bag and places it in main garbage container outside.
- 6. After removing the protective gear, employees shall wash their hands with soap and water. Employees shall also wash hands with soap and water any time during the job before eating, smoking or doing other things that might provide potential exposure.

NATURAL GAS LINE EMERGENCIES

In the event of a natural gas line emergency, stop work, shut down equipment in place, evacuate the immediate area. Immediately call Puget Sound Energy at 888-225-5773.

If a rupture or leak occurs, natural gas can migrate under paved or hard surfaces into buildings and surrounding areas. Since it is lighter than air, natural gas will rise to the ceiling inside a structure where it can create a potential for explosion.

Natural gas is distributed in a variety of pressures and types of pipe. Steel pipelines, generally covered in yellow plastic or black tar wrap ranging in size from half (1/2) inch to twenty (20) inches in diameter, are used when operating pressures are between sixty (60) and five-hundred and fifty (550) pound per square inch (PSI). These are considered high pressure (HP) mains.

Distribution pipelines serving homes and businesses are generally at a reduced or intermediate pressure (IP), typically thirty five (35) PSI to sixty (60) PSI. Bare or coated steel, wrought iron (two [2] to six [6] inches) and plastic polyethylene (PE) pipe (five-eights [5/8] to eight [8] inches) can be found.

In some older urban areas, gas is delivered at low pressures (LP) of approximately one-quarter (1/4) PSI, generally in cast iron pipe ranging size from four (4) to twenty (20) inches.

Work Practices

Directional boring: Gas lines must be pot-holed and identified prior to boring operations. Contact utility to verify pot-holed facilities prior to the boring operation. Leave pot-holes open and periodically inspect the facilities during the bore operation. Notify the utility immediately of any concerns.

Open Trenches

Once exposed, all natural gas facilities must be properly supported and protected from damage. If excavating parallel to a gas pipeline, call your local natural gas company for help with determining adequate support and protection for the pipeline. Failure to properly support pipelines could result in a break or rupture. Use acceptable back-fill material, with no sharp rocks, gravel or slurry which can damage the coating on steel pipelines and cause failure of plastic pipelines over time.

Natural Gas Incidents

Always call the local utility immediately to report any damage, leaks or any other natural gas incident. If gas is leaking, evacuate immediate areas where gas is present. Keep people and traffic a safe distance away and remove any source of ignition (open flames, turn off engines/equipment, radios, etc.) around the area of the damaged line until the utility arrives. If concerned with public safety always call 911 first.

Don't try to repair a damaged or broken natural gas line by covering, crimping, bending or otherwise restricting the flow.

Don't touch a plastic pipe that is leaking. A spark from static electricity on plastic pipe could become an ignition source.

Don't try to extinguish a gas flame or fire. If the natural gas is burning, let it burn! If there is a threat to life or property call 911, and then call the natural gas provider.

If the gas leak is small, call the gas company first. Keep everyone, including workers and the public, away from the source of the gas leak.

If the leak is large, or threatens the public or structures, call 911.

Do not attempt to stop or fix the leak. Do not attempt to fight any resulting fires. Evacuate the area and assist emergency personnel as requested.

AUTOMOTIVE/VEHICLE SAFETY

GENERAL

A defensive driver is one who commits no driving errors and makes allowances for the other driver. The defensive driver adjusts his/her own driving to compensate for unusual weather, road, and traffic conditions and is not tricked into an accident by the unsafe actions of pedestrians and other drivers. By being alert to accident inducing situations, the defensive driver recognizes the need for preventive action in advance and takes necessary precautions to prevent the accident. As a defensive driver, you know when it is necessary to slow down, stop or yield the right-of-way to avoid involvement.

For more detailed information on vehicle use see Directive 64, *Guidelines for Assignment and Use of District Vehicles*, and Directive 52, *Fitness for Duty*.

Only those employees specifically authorized and who possess a valid driver's license or permit shall operate District-owned motor vehicles or personally owned vehicles on District business.

Employees are responsible for notifying their immediate supervisor promptly of any traffic accident, citation, arrest, suspension or cancellation of the state driver's license or any physical disability that might affect driving ability resulting from operation of the motor vehicle on official business.

Drivers shall know and obey all state and local motor vehicle laws applicable to the operation of their vehicle.

The driver shall drive at safe speeds no greater than that permitted by law. Traffic, road and weather conditions shall be given consideration in determining the safe speed within the legal limit at which the vehicle shall be operated.

The driver shall be responsible for checking the following items before operating the vehicle: Brakes, lights, reflectors, turn signals, windshield wipers and horn. The driver shall be responsible for reporting any defects that would cause the vehicle to be unsafe to operate.

A driver will not allow anyone not directly associated with District business to ride in or on any vehicle while it is being operated. Employees shall not permit anyone to ride on the running boards, fenders, or any part of the vehicle except the seats or inside body wall. Passengers shall not stand in moving vehicles.

Employees shall not jump on or off vehicles in motion.

All employees are required by law to wear seat belts when operating or riding in District motor vehicles.

Use of cellular telephones while driving is illegal. If a cellular telephone is needed, it must be operated using a hands-free system.

The operator of a motor vehicle shall clearly signal any intention of turning or passing.

Upon a signal from an emergency vehicle approaching from the rear, the driver of a District vehicle shall yield the right-of-way by pulling over to the right side of the roadway until the emergency vehicle has passed.

The driver of the vehicle shall be courteous toward other operators and pedestrians. He/she shall operate the vehicle in a safe manner and shall yield the right-of-way to pedestrians and other vehicles when failure to do so might endanger any person or another vehicle. In other words, drivers shall be prepared to stop and the right-of-way shall be yielded in all instances, where necessary, to avoid an accident.

The driver shall stay a sufficient distance behind when following another vehicle so that the vehicle can safely stop with a clear distance ahead. (Rule of thumb, three-second rule minimally for following distance and see where the tires meet the pavement or ground when a vehicle stops in front of you).

Drivers shall exercise added caution when driving through residential and school zones.

When entering or leaving any building, enclosure, alley or street where vision is obstructed, a complete stop shall be made and the driver shall proceed with caution.

Before a radio-equipped vehicle is driven under or adjacent to energized equipment, especially in substation areas, the radio antenna shall be lowered and clearance checked in order to ensure that proper clearances will be maintained between the vehicle and energized equipment.

All ignition systems shall be turned off and no smoking permitted while refueling.

ACCIDENT REPORTING

See U: Accident Reporting. District motor vehicle accidents involving injury or damage, regardless of extent, shall be reported. This includes accidents and incidents occurring while using your personal vehicle for work-related transportation. Instructions for accident investigation and reporting, including forms, may be found in Section U of this Accident Prevention Manual.

Responsibilities

The **Senior Manager of Safety** is responsible for the administration of the PUD Motor Vehicle Driver Safety Program. All employees who operate motor vehicles on official business shall complete the District's Defensive Driving Course as soon as practical following employment and at least every five (5) years thereafter. The Senior Manager of Safety may recommend suspension or reinstatement of employee's driving privileges based on conditions stated in Directive #60 (*Guidelines for Assignment and Use of District Vehicles*).

Supervisors are responsible for determining the driving requirements of positions to be filled and are responsible for assuring that employee's hold valid driver's licenses with the proper endorsements for the type of vehicle being operated.

For drivers affected by the District's Commercial Driver's License (CDL) Program for specific job titles, training may be coordinated through the Line Training department. The bi-annual physicals required for such licenses are paid for by the District for persons currently employed. State regulations require employees with commercial licenses to notify the District if their license is suspended, revoked

or canceled or if they are convicted of any moving traffic violations either in their private automobile or a commercial vehicle. These requirements are outlined in the Commercial Driver's License Program and results of failing to adhere to the program are outlined in the District's Directive #60 Guidelines for Assignment and Use of District Vehicles.

BACKING

- 1. Driver should try to avoid backing whenever possible.
 - a) Whenever possible the vehicle shall be positioned to avoid the necessity of backing.
 - b) Never back an inch more than necessary.
 - c) When backing is necessary, it's recommended that vehicles be backed into driveways upon arrival, rather than backing out into traffic when the job is completed.
- 2. When backing a vehicle a driver must:
 - a) Know what is behind the vehicle.
 - b) Not depend entirely upon mirrors or back-up cameras.
 - c) Use another person as a ground guide when applicable.
 - d) Not rely on audible reverse signs in congested areas. Look before backing.
 - e) Report any malfunction to audible reverse signal if vehicle is so equipped.
 - f) Back slowly.
- 3. When backing construction vehicles, construction equipment, vans, or any vehicle with an obstructed view to the rear, if another employee is available, that person **MUST** be stationed at the rear of the vehicle to assist the driver in backing the vehicle safely.
- 4. An unassisted driver should not assume that there are no obstructions to the rear. Prior to backing, a dismounted inspection by the driver is the only method to determine that the way is clear.
- 5. Before backing a dump truck, the driver must determine no one is currently in the backing zone and it is reasonable to expect no employee/pedestrian will enter the backing zone while operating the dump truck in reverse.

If employees are in the backing zone, or it is reasonable to expect someone may enter the backing zone, you must make sure the truck is backed up only when:

- The vehicle has an operable automatic reverse signal alarm audible no less than fifteen (15) feet from the rear of the vehicle above the surrounding noise level **and**
 - An observer signals that it is safe to back, or,
 - An operable mechanical device that provides the driver a full view behind the dump truck is in use.

Exemption

Employees are considered protected when they are on the opposite side of a fixed barrier such as:

- A jersey barrier;
- Heavy equipment (such as a paving machine); or
- A six (6) inch concrete curb.

Note: The term dump truck includes both belly and rear dump trucks with a minimum pay load of four yards.

PARKING

When parking and leaving a vehicle unattended, turn the engine off, remove the key and set the emergency brake.

If the vehicle is equipped with an automatic transmission, put the gear selector in the park position. If the vehicle has a manual transmission, leave it in gear.

Turn the front wheels if the vehicle is to be left on a hill. Facing downhill, the wheels should be turned sharply toward and against the curb. Uphill, the wheels should be sharply turned away with the back of the wheels against the curb. Where there is no curbing, the wheels should be turned toward the edge of the roadway.

To be legally parked, a vehicle must be within twelve (12) inches (30.5 centimeters) of the curbing.

Never stop or leave a vehicle standing on the main traveled portion of the roadway, unless the vehicle is disabled and stopping is unavoidable.

Parking is prohibited in the following places:

- 1. On a sidewalk or no-parking strip.
- 2. Within five (5) feet (1.5 meters) of a public or private driveway.
- 3. Within an intersection.
- 4. Within fifteen (15) feet (4.5 meters) of a fire hydrant.
- 5. Within twenty (20) feet (6 meters) of a crosswalk at an intersection.
- 6. Within thirty (30) feet (9.1 meters) of any flashing light, stop sign or traffic-control signal at the side of the roadway.
- 7. Between a safety zone and the curb, or within thirty (30) feet (9.1 meters) of either end of the safety zone, unless a different distance is indicated by signs or markings.
- 8. Within fifty (50) feet (15.2 meters) of the nearest rail or railroad crossing.
- 19. Within twenty (20) feet (6 meters) of any fire station driveway or within seventy-five (75) feet (22.8 meters) of the entrance if on the opposite side of the street.
- 10. Beside any street excavation or obstruction where stopping, standing or parking would obstruct traffic.
- 11. On the roadway side of any vehicle stopped at the edge or curb of a street or highway (commonly known as double parking).
- 12. On any bridge or other elevated structure on a highway.
- 13. In a highway tunnel.
- 14. Any other place where official signs prohibit stopping.

VEHICLE MAINTENANCE

Workers can avoid injuries and accidents by following proper procedures for working on vehicles, practicing good housekeeping in the shop, wearing personal protective equipment for hazardous tasks, and obtaining a thorough knowledge of repair and cleaning equipment and tools.

Compressed air shall not be used for cleaning purposes except when effectively reduced to thirty (30) psi when hose or nozzle is dead-ended, and then only with effective chip-guarding and personal protective equipment.

Employees shall use jacks that are sufficient in capacity to sustain the load.

Jacks shall have their rated load capacity permanently and legibly marked on them in a prominent place. Hand-held portable grinders shall be equipped with safety guards that cover the abrasive wheel. No employee shall service the rim wheel unless the employee has been trained and instructed in correct procedures of servicing the type of wheel being serviced; the procedures shall include the following elements:

- 1. The tire shall be completely deflated before de-mounting by removal of the valve core.
- 2. Tires shall be completely deflated by removing the valve core before the rim wheel is removed from the axle in either of the following situations:
 - a) When the tire has been driven under inflated at eighty (80) percent or less of its recommended pressure, or
 - b) When there is obvious or expected damage to tire or wheel components.
- 3. Rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the wheel and inflation of the tire, unless the tire or wheel manufacturer recommends against it.
- 4. If a tire on a vehicle is under-inflated but has more than eighty (80) percent of the recommended pressure, the tire may be inflated while the rim wheel is on the vehicle provided remote control inflation equipment is used, and no employees remain in the trajectory during inflation.
- 5. Tires shall be inflated outside a restraining device only to a pressure sufficient to force the tire bead onto the rim ledge and create an airtight seal with the tire and bead.
- 6. Whenever a rim wheel is in a restraining device, the employee shall not rest or lean on any part of his/her body or equipment on or against the restraining device.
- 7. After tire inflation, the tire and wheel components shall be inspected while still within the restraining device to ensure they are properly seated and locked. If further adjustments to the tire or wheel components are necessary, the tire shall be deflated by removal of the valve core before the adjustment is made.
- 8. No attempt shall be made to correct the seating of side and lock rings by hammering, striking, or forcing the components while the tire is pressurized.
- 9. Cracked, broken, bent or otherwise damaged rim components shall not be reworked, welded, brazed or otherwise heated.

10. Whenever multi-piece rim wheels are being handled, employees shall stay out of the trajectory unless the District can demonstrate that performance of the servicing makes the employee's presence in the trajectory necessary.

A restraining device shall be used for inflating tires on multi-piece wheels.

A barrier or restraining device shall be used for inflating tires in single piece wheels unless the rim wheel will be bolted onto a vehicle during inflation.

When tires are being inflated, employees shall use an airline assembly that consists of the following:

- 1. A clip-on chuck
- 2. An in-line valve with a pressure gauge or a pre-settable regulator, and
- 3. A sufficient length of hose between the clip-on chuck and the in-line valve (if used) to allow the employee to stand outside the trajectory
- 4. Current charts or rim manuals containing instructions for the types of wheels being serviced shall be consulted
- 5. Employees shall follow safe, established and recommended procedures for servicing single piece rim wheels
- 6. Dump trucks shall have a device installed on the frame that will be of sufficient strength to hold the bed in a raised position when employees are working in an exposed position underneath

VEHICLE ASSIST GUIDELINES

The District operates and maintains an extensive fleet of vehicles and equipment to carry out its business and public service goals. During the delivery of required services, vehicles occasionally become stuck or temporarily disabled by conditions such as snow, grass, mud, or uneven terrain. To correct this situation, the stuck vehicle may be assisted so that it can be returned to service. The District does not permit employees to engage in on-road towing by one vehicle with a second vehicle. Short of a tow, if the vehicle can be assisted by a second vehicle with a tug or roll to free or extract it, this will be permitted, provided the employees involved have the proper training, equipment and number of employees to perform the extraction safely. Only District vehicles may assist or be assisted.

The following guidelines are intended to describe those circumstances and dos/don'ts of vehicle assistance, with the goal of providing common sense, easy-to-follow instructions. If at any time, the responsible supervisor, lead, or foreman present at the job site or location is not confident that the task can be performed safely, he/she should immediately contact Transportation Services to request that a tow truck be dispatched to the scene.

These guidelines are provided for all District employees and are intended to be reviewed during safety meetings, along with training on safe use of a towing strap and proper methods to extract a stuck vehicle. Only District-approved towing straps may be used; the District-approved towing strap is a 30' heavy-duty towing strap rated at 15,000 lbs., with no metal parts. The towing strap is to be kept in the District vehicle in the carry bag provided for this purpose. These guidelines only apply to District

vehicles used on the road, and do not include backhoes, track hoes, dozers, and other off-road machinery.

Vehicle Assist DON'Ts

- 1. If the stuck vehicle is buried up to any one axle or more.
- 2. If the involved vehicle is mechanically disabled (engine, brakes, boom, hydraulics, etc.).
- 3. When the stuck vehicle is in an environmentally sensitive area.
- 4. If the stuck vehicle involves bad angles (in excess of forty-five (45) degrees, or the towing strap comes in contact with pintle hook latch).
- 5. If assist of the stuck vehicle would cause vehicle damage to either the involved vehicle or to the environment.
- 6. If the involved vehicle is either the crane #599, 4-drum puller #597, or double elevator hi-line truck #535, or truck 6500.
- 7. When working alone.
- 8. If the approved towing strap and/or front-end winch line is not available.
- 9. If the frame-mounted tow hook, pintle hook, or receiver-type hitch is not available.
- 10. If the ground is not sufficiently level.
- 11. If the vehicle used to make the assist may also get stuck.
- 12. Booms must never leave the storage rest when towing or assisting.

Vehicle Assist DOs

- 1. Think safety and use common sense to assess the situation. Evaluate the terrain in making the decision. Visually inspect the towing equipment before starting the assist.
- 2. Conduct a tailboard meeting with all crew members.
- Define/agree on communication methods and signals before beginning the assist; use of the 900 MHz on the direct channel is encouraged.
- 4. Before beginning the assist, clear area of all non-involved personnel.
- 5. Only District vehicles may assist or be assisted.
- 6. Only use District-approved towing strap; never use chains or lifting straps.
- 7. If hooking straps together, basket/cradle the straps together (no shackles or clevis).
- 8. Hook only to frame-mounted tow hook, pintle hook or receiver-type hitch.
- 9. Front mounted winches use single line pull only; do not double line with the use of a block. The diameter on the winch impacts pulling capacity.
- 10. Roll a vehicle out instead of pulling whenever possible dig out the vehicle wheels and make a ramp if possible.

11. Walk-around the previously stuck vehicle after extraction and clean debris out of the wheels and bumpers so that nothing flies out and creates damage to other vehicles. Ensure that brake linkage is clear of debris.

WARNING! Once the slack is out of the strap, **STOP** the pull if the pulling vehicle travels three (3) feet without moving the vehicle being assisted. It's time to call for a tow truck! You will break the strap.

GENERAL OFFICE SAFETY

Employees shall immediately report all injuries, regardless of severity, to their supervisor.

Employees shall walk cautiously up and down stairs. The handrail shall be used whenever possible.

Floors, landings and stairs will be kept free of debris.

Drawers of desks and file cabinets shall be kept closed when not in use.

Only one drawer of a file cabinet shall be pulled out at a time in order to avoid overbalancing, unless the cabinet is securely fastened to the wall or to other cabinets. Material shall not be stored on top of filing cabinets.

Do not sit on edge of a chair. Do not tilt back when sitting in a straight chair.

Boxes, chairs, etc., shall not be used in place of ladders.

The floor shall be kept free of tripping hazards such as telephone cords, electric extension cords and paper cartons.

Material shall be stored on shelves in a manner to prevent falling; heavy objects shall be placed on lower shelves.

Employees shall not use ventilation fans unless they are guarded or securely placed at least seven (7) feet above the floor and approved in advance by the Facilities department.

Solvents and other volatile or toxic substances shall be used only with adequate personal protection or in well-ventilated areas.

Employees shall not attempt to clean, oil, or adjust any machine that is running. If the machine is not equipped with a starting switch that can be locked in the off position, it shall be disconnected from its power source.

Unsafe electrical cords, faulty electrical or other equipment or any other hazardous condition shall be reported.

Proper clothing for the work being performed must be worn. Loose-fitting clothing, dangling bracelets, rings and ties may cause serious injury to employees operating or working around power-driven machines and shall not be worn.

Broken glass or other sharp objects shall not be placed in waste paper containers.

Common or sharp pointed pins shall not be used for fastening papers together. Staples, paper clips or other approved fasteners shall be used.

Paper cutter blades must be lowered and locked after use.

Torn carpet, missing/broken tiles and other unsafe conditions shall be reported to Facilities immediately.

Heaters shall not be used unless they are an approved type and are equipped with an automatic shut-off device in the event they are tipped over and approved in advance by the Facilities department.

Chair castors shall be of the type that insures compatibility with the surface on which they will be used.

ERGONOMICS

The Safety Department provides ergonomics information in the District's Accident Prevention Manual, and on the Safety website. New office employees will be required to watch the office ergonomics video on the Safety website. Existing employees may find it useful as a refresher. In addition to the video, you will find short, 1-2 minute video segments on adjusting your chair, keyboard, mouse, or monitor. There are also segments with quick and easy stretches to do throughout your day that are designed to reduce tiredness.

Please notify your supervisor if you are experiencing discomfort or pain.

Contact Facilities or Safety for workstation adjustments or assessments: They will work with departments, supervisors and employees to find reasonable cost-effective solutions to reduce or eliminate potential risk factors. If determined a change can be made, the supervisor will coordinate with Safety and other departments as needed to implement recommendations. Supervisors and employees will monitor changes for effectiveness.

Contact Facilities for information about ergonomic assessments, footrests, ergonomic keyboards, mice/track balls, keyboard tray removal, etc.

Note: Non-standard computer items, not budgeted for by IT, are paid for out of the budget of the requesting department.

Ergonomics Set-up

Employees whose job duties require the use of computer workstations shall consider the following:

STEP 1 - ADJUST CHAIR

- Adjust chair height so feet are firmly supported on the floor and hip angle is 90°-120° with knees slightly lower than hips. Footrests are available through Facilities.
- Adjust seat depth so two (2) to three (3) fingers can fit between back of knee and front edge of chair while hips are all the way back in chair.
- Sit back in your seat so that your back is fully supported. Keep your seat back in a locked position instead of allowing it to rock back and forth freely. If you choose to have your chair in the rock position, you can increase the seat back tension for better support.
- Adjust seat back lumbar support so it fits the natural curve in the small of your back.

- For desktop keyboarding: Lower arm rests if they don't allow you to sit with your stomach all the way up to your desk.
- For keyboard tray use: Adjust arm rest height to support forearms without causing shoulder shrugging, slouching or elbow winging (to the side).

STEP 2 - ADJUST KEYBOARD

- While seated, sit with arms relaxed by side and bend elbows so hands are just below elbow height. If hands are two (2) to four (4) inches below desk, you may elect to rest forearms on desktop with computer equipment pushed back. You may also use a keyboard tray. (If hands are above the desk, you may need desk to be raised.)
- If you choose a keyboard tray, adjust height of keyboard tray so that forearm is in line with keyboard. Objective is to keep wrists straight. You may need to tilt keyboard tray to achieve straight wrists. Most commonly, the back (far) edge of keyboard tray should be tilted downward.

STEP 3 - MOUSE

• Place mouse at keyboard level. Wrists should not be bent up, down or sideways.

STEP 4 - MONITOR

- Place monitor directly centered in front of you. If you have two (2) monitors that are used equally, center them and put them at an angle slightly inward towards each other.
- Adjust height of monitor so that if you drew a straight line horizontally from eyes to monitor, your gaze would hit two (2) to three (3) inches below top of monitor. (If you wear bifocals, the monitor needs to be much lower.)
- Monitor should be about an arm's length away (plus or minus an additional hand length).



A TIME TO STRETCH

Performing simple stretches throughout the workday increases circulation and flexibility, improves posture and reduces tension. None of these stretches or exercises should cause pain or discomfort and you should only feel mild to moderate tension. Remember to breathe in a relaxed fashion. If a stretch hurts, ease off or modify as needed.

For more information about ergonomics and stretching, contact Safety at x4441. For additional resources, visit the Safety website and select "Ergonomics."

If you would like an ergonomic assessment of your workstation, call Safety at x4441 or Facilities at x8622.

Perform one stretch for 8-10 seconds every 30-60 minutes throughout the work day.



Neck Stretches


FIRST AID

FIRST AID

First aid is the immediate and temporary care of a person who is injured or ill to prevent death or further injury, relieve pain and counteract shock until medical aid can be obtained. All employees are asked to be able to give proper assistance until emergency medical aid can be obtained.

Proper first aid controls loss of blood, may return natural breathing, assist circulation, prevent or reduce shock, protects wounds and burns from infection, immobilizes fractures and dislocations, reduces pain and conserves the injured person's strength so when medical aid is provided, the chance of recovery is improved.

The District provides first-aid training to all employees whose job duties require it and internally to all employees on District time. Classes are held frequently.

General procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids and a one-way breathing device if CPR is necessary.
- 2. Prevent further injury.
- 3. Check conditions known to be life-threatening.
- 4. Protect injuries from infection and complications.
- 5. Make the injured person as comfortable as possible to conserve strength and reduce shock.
- 6. Arrange for proper transportation of the injured to a medical facility when required.
- 7. Report contact with blood or bodily fluids immediately to Safety.
- 8. The Energy Control Center (425-783-5040) must be notified any time an employee requires medical treatment beyond first aid for any of the outlined incidents.

Don'ts:

- 1. Do not remove the bandage or cloth padding initially placed on the wound to stop bleeding.
- 2. Do not attempt to cleanse the wound if the injury requires medical care.
- 3. Do not move the injured person or elevate his/her legs if you suspect a spinal injury.
- 4. Do not use CPR if the injured person is breathing.
- 5. Do not complicate the injury during transportation.

WOUNDS WITHOUT SEVERE BLEEDING

Wounds without severe bleeding that do not involve tissue deeper than the skin should be cleansed thoroughly. There may be some contamination, which should be removed before the injury is dressed and bandaged, especially if medical attention is delayed. Removal of foreign materials in muscle or deep tissue should always be carried out by a licensed physician.

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. To clean a wound, wash in and around it to remove bacteria and other foreign matter.
- 3. Rinse the wound thoroughly by flushing with clean water, preferably running tap water.
- 4. Blot the wound dry with a clean cloth.
- 5. Apply a dry sterile bandage or clean dressing and secure it firmly in place.
- 6. Caution the injured person to see a physician promptly if evidence of infection appears.
- 7. Consult a physician who may advise additional home remedies for the care of small wounds.
- 8. Report contact with blood or bodily fluids immediately to Safety.

Don't:

- 1. Do not try to remove material from the wound. No matter how dirty the wound appears, this will cause more bleeding.
- 2. Do not remove impaled objects. Bandage in place, seek additional medical attention.

SHOCK

Shock results from an inadequate supply of oxygen to body tissues.

Signs

- Tissue color is pale
- Skin is moist and clammy
- Pulse is rapid and weak
- Breathing is shallow
- Vomiting may result
- Mental confusion

Symptoms

- Restlessness and anxiety
- Nausea

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Ensure open airway and adequate breathing.
- 3. Check pulse and ensure adequate circulation.
- 4. Control serious bleeding.
- 5. Maintain body temperature.
- 6. Raise the legs to help blood flow to the brain. Make sure there are no spinal injuries.

Don't:

- 1. Do not raise the legs if increased pressure in the abdomen, chest, back, and head would cause harm.
- 2. Give nothing by mouth as the person may vomit and choke.

BLEEDING CONTROL

Hemorrhage or bleeding is the loss of blood from the circulatory system. The loss of two (2) pints of blood by an average adult is serious and the loss of three (3) pints may be fatal.

Signs

Artery:	Spurting blood, bright red in color
Vein:	Continuous flow, dark red in color
Capillary:	Blood oozing from wound
Shock:	Pale tissue color, moist clammy skin
Pulse:	Rapid, weak. Vomiting may occur

Symptoms

- Pain in the affected area
- Nausea

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Apply direct pressure over the wound. In most cases, bleeding can be stopped by placing a sterile dressing over the wound and fastening it securely in position with a bandage.
- 3. If direct pressure does not work for arterial bleeding, use direct pressure on the pressure points. Hold the pressure point for thirty (30) to sixty (60) seconds while a clot forms at the injury site to control bleeding.
- Elevate the injured extremity to restrict the flow of blood to the area and to assist in drainage. Make sure elevation will not cause further damage. Keep the injured person lying down and calm.
- 5. Apply cold packs to an area if internal bleeding is suspected.
- 6. Treat for shock.

Don't:

- 1. Do not waste time, control bleeding immediately.
- 2. Do not give anything by mouth.
- 3. Bandage the wound securely but not too tightly. A tight bandage may interfere with the blood supply and cause serious complications. When bandaging the arms or legs, leave tips of the fingers or toes uncovered if possible so they remain visible for monitoring blood circulation. This permits easy examination to determine if bandages are too tight. Place the part to be bandaged in the

FIRST AID

position in which it is to be left. Remember that swelling frequently follows an injury, and that a tight bandage may cause serious interference with circulation to the body part. Do not apply a bandage too loosely as it may slip off and expose the wound. If the injured person complains that the bandage is too tight, loosen it and make it comfortable but snug.

CARDIOPULMONARY RESUSCITATION (CPR)

Opening the airway and providing CPR when respiration and pulse have stopped can save a person's life. Early intervention may prevent cardiac arrest. If the heart continues to beat, oxygen will circulate to the brain and other vital organs. If available, use an automatic external defibrillator (AED) along with CPR.

Procedures

- 1. Call for help.
- 2. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 3. Wear protective gloves and use a one-way breathing device.
- 4. Begin resuscitation immediately if the injured person is not breathing.
- 5. Look, listen and feel for breathing. If not breathing, tilt chin and give two (2) full slow breaths. Check for pulse; if pulse is absent begin compressions.

Depress sternum one and a half (1-1/2) to two (2) inches. (For an adult). Thirty (30) compressions at the rate of one-hundred (100) a minute. Two (2) breaths. Provide continuous cycles of thirty (30) compressions and two (2) breaths.

- 6. If possible, place the person so his/her head is slightly lower than his/her feet to allow better drainage of fluid from respiratory passage.
- 7. Maintain an open airway by tipping the chin back. Loosen any tight clothing about the head, neck.
- 8. Maintain normal body temperature; keep the person warm by covering with blankets, clothing or other material. Always treat for shock.
- 9. If natural breathing and pulse resumes but then stops, resume CPR.
- 10. Keep the person lying on his/her back or side; try to keep him/her from sitting or standing.
- 11. If the person is to be moved, he/she should remain prone and carried on a stretcher.

Don't:

- 1. Do not take time to move the person to a better location unless the current area is unsafe. Begin CPR immediately.
- 2. Do not delay CPR by taking time trying to remove clothing or warm the person.
- 3. Do not fight any attempt if the person begins to breathe on his/her own, adjust your time to his/hers.
- 4. Do not leave the person once natural breathing begins, the heart could stop again.

5. Do not give liquids by mouth.

HEART ATTACK

Coronary thrombosis is what most people mean by a heart attack. When the artery channel has become narrowed, a blood clot may form inside the artery to block the channel and cut off the flow of blood to the part of the heart supplied by that artery.

Signs

Profuse sweating, tissue color pale and blue.

Symptoms

Severe painful sensation in the front of the chest, sometimes spreading to the left arm, shoulders, neck, jaw and often lasting for hours. Some heart attacks are accompanied by nausea, vomiting, dizziness and shortness of breath.

Procedures

- 1. Call Energy Control Center (425-783-5040) immediately.
- 2. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 3. If conscious, place person in a comfortable position sitting up. Use pillows for support.
- 4. Keep warm and loosen collar.
- 5. If heart stops, administer CPR.

Don't:

- 1. Do not perform CPR if person is breathing.
- 2. Do not administer liquids by mouth.
- Don't hesitate to call emergency medical services immediately when symptoms have been present at least two (2) minutes. The greatest risk of death from a heart attack occurs within the first two (2) hours after symptoms begin. It is urgent that the person be seen by a health care professional as soon as possible.

ANGINA

Angina is a pain in the chest caused by reduced blood flow to the heart muscle.

Signs

- Physical and emotional stress.
- Anxiety.
- Pain in chest.
- Shortness of breath.
- Pain may radiate.

Procedures

- 1. Have person sit down and assume a position of comfort.
- 2. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 3. If the person has nitroglycerin, assist them in taking it as prescribed by their physician.
- 4. If pain is not relieved by rest and nitroglycerin, call for medical help immediately.

CONGESTIVE HEART FAILURE

Congestive heart failure results from the heart not pumping effectively.

Signs

- Noisy breathing
- Swelling of ankles and lower legs

Symptoms

- Shortness of breath, fatigue
- Difficulty breathing when lying down
- May use several pillows at night or sleep sitting up in order to breathe

Procedures

- 1. Let the patient assume a position of comfort.
- 2. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 3. If serious breathing difficulty occurs, call emergency medical services.
- 4. If mild signs/symptoms, see a doctor immediately.

STROKE

A stroke is a rupture, or clot in an artery serving the brain.

Signs

- Respiration slow, may sound like snoring
- Drooling
- Face/body droops to one side
- Ability to speak may be impaired
- Tissue color flushed, then pale
- Lower consciousness level
- Pulse slow and strong becoming rapid and weak
- Pupils may be unequal

Symptoms

• Anxiety

- Weakness, loss of feeling
- Paralysis on one side of the face or body

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Reassure and communicate with the person.
- 3. Call emergency medical services.
- 4. Allow person to assume position of comfort.
- 5. If unconscious but breathing, place the person on the affected side to allow drainage from the mouth.
- 6. Help maintain an open airway as the person may have difficulty due to paralysis or lowered consciousness level.
- 7. If there is no breathing or pulse begin CPR.

ALLERGIC REACTIONS

An allergic reaction is an overreaction by the body to a substance that is normally harmless (e.g., seafood, penicillin, bee stings).

Signs

- Skin flushed, hives may appear
- Shock may occur
- Breathing difficulty, wheezing, coughing
- Lower consciousness level
- Swelling may appear in face, eyes, tongue, and throat
- Cardiac arrest or respiratory failure may result

Symptoms

- Itching, burning sensation
- Nausea, weakness, dizziness
- Tightness in chest

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Immediately call emergency medical services.
- 3. If person has emergency medication such as an Ana-kit or Epi-pen assist as required.
- 4. Pass on information to paramedics or doctor if any medication was taken.

POISONING

Exposure to a poisonous substance or overexposure to a normally harmless substance.

Signs

- Drowsiness or loss of consciousness
- Burns around the mouth or on the hands
- Convulsions
- Shallow breathing

Symptoms

•

Nausea, cramps, stomach pain

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Conscious person:
 - a) Contact the Washington Poison Control Center: 206-634-5252 in Seattle
 - b) Gather as much information about the poison as possible.
 - c) Follow Poison Control Center instructions.
- 3. Unconscious person:
 - a) Call emergency medical services.
 - b) Monitor airway, breathing and circulation.
- 4. Do not induce vomiting unless instructed by Poison Control Center.
- 5. Save vomitus, bottles, containers, needles, etc., for doctor, paramedics, or police.
- 6. If person has inhaled poison fumes, avoid inhaling any fumes yourself, move the person immediately to fresh air.

DIABETIC COMA

A diabetic coma occurs due to excessively high blood sugar.

Signs

- Frequent urination
- Rapid deep, sighing respirations
- Warm, dry skin
- Sweet odor on breath
- Restless, confused, irritable
- Lowered conscious level

Symptoms

• Thirsty

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. If patient is conscious give sweet fruit juice, sugar, honey or other sugary substances.
- 3. If patient is unconscious, place small amounts of glucose, cake mate, jelly, or honey inside the lower lip or between cheek and gum.
- 4. If patient does not respond promptly and becomes alert and oriented, call emergency medical services and provide primary care until help arrives.
- 5. Monitor person closely and ensure clear open airway.
- 6. Do not give artificial sweeteners they do not help.
- 7. Never administer insulin. **NO EXCEPTIONS**.
- 8. If patient is unconscious monitor airway, breathing and circulation.

DIABETIC INSULIN SHOCK

Insulin shock results from excessively low blood sugar.

Signs

- Disoriented, confused, irritable
- Patient may lose consciousness
- Pale tissue color
- Moist clammy skin
- Respiration shallow or normal
- No sweet odor on breath

Symptoms

- May become unresponsive
- Confused or disoriented

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. If patient is conscious, give sweet fruit juice, sugar, honey or other sugary substances.
- 3. If patient is unconscious, place small amounts of glucose, cake mate, jelly, or honey inside the lower lip or between cheek and gum.
- 4. If patient does not respond promptly and becomes alert and oriented, call emergency medical services and provide primary care until help arrives.
- 5. Monitor person closely and ensure clear open airway.
- 6. Don't give artificial sugars, they do not help.

EPILEPTIC SEIZURES

Interruption in normal electrical activity in the brain.

Signs

- Patient may suddenly stiffen and fall
- Jerking movements of the body
- Jaw muscles tighten
- Patient may stop breathing or make a hissing sound during the seizure
- May lose control of bowel or bladder
- Mild seizures may appear as staring spells or repetitive purposeless behavior

Symptoms

Patient may experience an aura (a subjective sensation; lights or aroma)

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Protect the person from injury during a seizure.
- 3. Remove objects from the vicinity that could harm the patient. Protect the patient from harming themselves but do not restrain them.
- 4. Reassure the patient during the seizure.

Following a Seizure

- 1. Allow the person to rest and keep bystanders away.
- 2. Do not place anything into the mouth.
- 3. Following a seizure, turn the person on their side, if needed, to let fluids drain from the mouth.
- 4. If the person fell during the seizure, assess for head, neck and back injuries.
- 5. Call emergency medical services if the person:
 - a) Is injured during the seizure.
 - b) Has no history of seizure.
 - c) Does not resume breathing following the seizure.
 - d) Have continuous seizures without regaining consciousness.
 - e) Requests emergency care.

FRACTURES AND DISLOCATIONS

A crack or break in the bone is referred to as a fracture.

Signs

- Deformity
- Swelling
- Discoloration
- Open fracture may have bleeding and wound at the fracture site
- The bone may or may not be visible
- Shock, tissue pale

Point tenderness

Symptoms

•

Pain

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Use cold packs to minimize swelling.
- 3. Cover wounds with dry dressings.
- 4. Splint if emergency medical services are not available.
- 5. Check for circulation and sensation frequently.
- 6. Loosen ties on the splint if they impair circulation or sensation.
- 7. Keep person comfortable and seek emergency medical services.

HEAD INJURIES

Head injuries involve wounds to the scalp, skull or brain.

Signs

- Lower level of responsiveness
- Wound of scalp or skull
- Blood or clear fluid draining from nose and/or ears
- Deformity of skull
- Bruising around the eyes and/or ears
- Vomiting
- Shallow or irregular breathing

Symptoms

Nausea

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. A head injury may cause neck injury from the mechanics of the body. Treat head, neck and body as one unit.
- 3. Closely monitor level of responsiveness. Seek medical aid if necessary.
- 4. Do not stop flow of blood or clear fluid from nose or ears.
- 5. Watch for vomiting.

NECK AND BACK INJURIES

Neck and back injuries involve injury to the spinal column or neck and spine area.

Signs

- Cuts, swelling, bruises on head, neck or back
- Point tenderness
- Note mechanism of injury (e.g., motorcycle accident, diving accident or auto accident)

Symptoms

Pain, numbness, tingling or paralysis

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Hold head and neck in position found. Call emergency medical services.
- 3. Reassure patient and keep from moving.
- 4. Keep head and neck stable until help arrives.
- 5. Move patient only if it is necessary to preserve life.
- 6. Treat head, neck and body as one unit.
- 7. Stop untrained person from moving the patient.
- 8. If the person must be turned, turn as a unit.

WOUNDS

A wound is a traumatic break in the skin that allows bodily fluids to escape and poisons and diseasecarrying microorganisms such as viruses and bacteria to enter.

Signs

- Bleeding, cuts, punctures
- Impaled objects, torn or amputated body parts

Symptoms

Pain, bleeding

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Check person in position found. If pain or discomfort occurs in the neck or back, stop assessment and keep immobile until additional help arrives.
- 3. Do not remove impaled objects. Bandage in place and call emergency medical services.
- 4. Apply direct pressure over the wound. In most cases, bleeding can be stopped by placing a sterile dressing over the wound and fastening it securely in position with a bandage.

FIRST AID

- 5. If direct pressure does not work for arterial bleeding, use direct pressure on the pressure points. Hold the pressure point for thirty (30) to sixty (60) seconds while a clot forms at the injury site to control bleeding.
- 6. Elevate the injured extremity to restrict the flow of blood to the area and to assist in drainage. Make sure elevation will not cause further damage. Keep the injured person lying down and calm.
- 7. Apply cold packs to an area if internal bleeding is suspected.
- 8. Treat for shock. Clean minor wounds with soap and water.
- 9. Clean puncture wounds as best you can without causing further harm. Tetanus, hepatitis or rabies shots may be necessary.
- 10. Stitches may be necessary for deeper wounds, especially those on the face or near joints.
- 11. Wrap amputated parts in cool, moist dressings for transport and possible reattachment. Keep tissue cool but do not expose directly to ice.

EYE INJURIES

Eye injuries involve damage to the eye or surrounding tissues.

Signs

- Red watery, inflamed eye
- Damaged tissue around eye
- Impaled object

Symptoms

- Pain
- Burning sensation, impaired vision

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. For chemical burns to the eye continuous flushing with water for fifteen (15) to twenty (20) minutes is recommended. Flush from inside corner out.
- 3. Do not remove impaled objects. Call emergency medical services. Bandage a paper cup over injured eye and also cover the other eye to reduce eye movement.
- 4. Keep patient from moving until medical services arrive.

EXPOSURE TO COLD (HYPOTHERMIA)

Hypothermia occurs when the body temperature is lower than normal.

Signs

- Shivering, loss of coordination
- Loss of consciousness
- Breathing and heartbeat slow or absent

Symptoms

- Weakness
- Difficulty performing tasks
- Making poor decisions
- Cool and wet, or cold environment

NOTE: Water and wet clothing accelerate heat loss

Procedures

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Treat person gently. Jarring the patient could cause an abnormal heart rhythm.
- 3. Prevent further heat loss. Shelter person from the wind and water.
- 4. Replace wet clothing with dry. Cover the patient's head.
- 5. If signs and symptoms are mild, you may add heat to the neck, armpits, and groin areas.
- 6. If signs and symptoms are severe, prevent further heat loss, seek emergency medical services.
- 7. Do not give alcohol, tobacco or caffeine.
- 8. Patient's judgment may be impaired. Help make decisions when needed.

FROSTNIP & FROSTBITE

Frostnip occurs with cooling of tissues, cheeks, chin, fingers, toes, ears. Frostbite occurs due to freezing of body tissue. Hands and feet are most commonly affected.

Signs

Frostnip	Gray or yellowish patches on the skin					
	Tissue soft, resilient					
Frostbite	Tissue pale, cold, solid					
	Feels wood-like					
	Tissue not resilient					
	Grayish patches					

Symptoms

Frostnip Little or no pain as it develops.Frostbite Lack of sensation.

Procedures

- 1. Protect yourself first by the use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Protect frozen areas from further damage. Do not thaw.
- 3. If feet are frozen you can walk on them if necessary. Once they begin to thaw, do not walk on them. Avoid thawing and re-freezing.

FIRST AID

4. Improper re-warming can increase tissue loss. Seek emergency medical services.

HEAT-RELATED ILLNESS

Step 1: Identify Environmental Factors

Several environmental factors can contribute to heat-related illness:

- Air temperature
- High humidity
- Radiant heat (from the sun and other sources)
- Air movement
- Conductive heat sources (such as the ground)
- Heavy labor or work tasks with long durations
- Employees wearing heavy clothing or personal protective equipment (PPE)

Step 2: Evaluate Environmental Factors

Once you have identified the environmental factors that are present at your worksite, evaluate them to determine their potential impact by following the recommendations below.

Air Temperature and Humidity

Heat Index (Apparent Temperature) Chart

The Heat Index (HI) is the temperature the body feels when heat and humidity are combined. The chart below shows the HI that corresponds to the actual air temperature and relative humidity. (NOTE: This chart is based upon shady, light wind conditions. *Exposure to direct sunlight can increase the HI by up to 15°F.*) (Due to the nature of the heat index calculation, the values in the tables below have an error of +/-1.3°F.)

Heat Index	General Effect of Heat Index on People in Higher Risk Groups						
80° to 89°	Fatigue possible with prolonged exposure/physical activity						
Caution							
90° to 104°	Sunstroke, heat cramps, and heat exhaustion possible with prolonged						
Extreme Caution	exposure/physical activity						
105° to 129°	Sunstroke, heat cramps, or heat exhaustion likely, and heatstroke possible						
Danger	with prolonged exposure/physical activity						
130° or higher	Uset / supervalue highly likely with continued over source						
Extreme Danger	Heat/sunstroke highly likely with continued exposure.						

|--|

	RELATIVE HUMIDITY (in percent)																					
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
	140	125																				
	135	120	128																			
	130	117	122	131																		
	125	111	116	123	131	141																
eit)	120	107	111	116	123	130	139	148														
renh	115	103	107	111	115	120	127	135	143	151												
ר Fah	110	99	102	105	108	112	117	123	130	137	143	150										
np (ir	105	95	97	100	102	105	109	113	118	123	129	135	142	149								
r Ten	100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
Ai	95	87	88	90	91	93	94	96	<i>9</i> 8	101	104	107	110	114	119	124	130	136				
	90	83	84	85	86	87	88	90	91	93	<i>9</i> 5	96	<i>9</i> 8	100	102	106	109	113	117	122		
	85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	<i>9</i> 5	97	99	102	105	108
	80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	<i>89</i>	91
	75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
	70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72

Drinking water. When heat-related illness hazards are present, drinking water must be provided and made readily accessible in sufficient quantity to provide at least one quart per employee per hour.

Radiant Heat from the Sun and Other Sources

Recognize radiant heat sources

Radiant heat is the transfer of heat energy through the air. Examples include heat generated from the sun, rocks, shingles, cement, machinery, and buildings. Not all surfaces radiate heat equally. Darker and smoother surfaces (e.g. asphalt parking lot) absorb and radiate greater amounts of heat than rough and light-colored surfaces.

Air Movement

Determine how air movement affects the worksite

Air movement affects an employee's ability to cool off. Air movement aids in the transfer of heat from warm skin to cooler air (convection) and sweat evaporation. Even moderate breezes can significantly increase the rate of heat loss. At air temperatures less than skin temperature (approximately 95°F), the body will lose heat. However, the reverse effect can occur if the air temperature is higher than skin temperature. The air movement can cause the body to gain heat at a higher rate by transferring the heat of the air to the skin.

Conductive Heat Sources

Recognize sources of conductive heat

Conductive heat is heat that is transferred when an employee comes into direct contact with a heat source. Examples include hot walking surfaces, tools, machinery, and vehicles.

Workload Activity and Duration

Determine the workload severity and duration of job tasks

Physical work produces internal heat in the body. During moderate to heavy work the body needs to compensate in order to rid itself of the excess heat produced. At the same time, other environmental factors increase the overall heat load on the body and limit the amount of heat that can be effectively eliminated. Monitoring workload and duration in relation to the other environmental factors is critical in preventing heat-related illness.

Categories	Example Activities
Destine	Sitting quietly
Resting	Sitting with moderate arm movements
	Sitting with moderate arm and leg movements
liaht	Standing with light work at machine or bench while using mostly arms
Light	Using a table saw
	Standing with light or moderate work at machine or bench and some walking about
	Scrubbing in standing position
Moderate	Walking about with moderate lifting or pushing
	Walking on level ground at six (6) km/hr while carrying three (3) kg weight load
Heavy	Carpenter sawing by hand
	Shoveling dry sand
	Heavy assembly work on a non-continuous basis
	Intermittent heavy lifting with pushing or pulling (e.g., pick-and-shovel work)
Very Heavy	Shoveling wet sand

Determine the effect of clothing and PPE

PPE is important for worker safety. When controlling heat-related illness environmental factors, PPE can increase the risk of heat-related illness. Fabrics that do not freely breathe will trap sweat next to the skin. This has the same effect as raising the humidity and will greatly decrease the cooling we otherwise get from sweating. Non-breathing clothing also restricts the removal of body heat by air convection (transferring heat from the skin to the surrounding air). Encourage employees to wear loose fitting, lightweight fabrics. Examples of fabrics that breathe include cotton and cotton blends.

FIRST AID

Heat-Related Illness	Symptoms you may experience	Signs to look for in others	Treatment			
Heat Rash	 Red, blister-like eruptions Itching (prickly sensation) 	- Red, blister- like eruptions	Rest in a cool placeAllow the skin to dry.Monitor for infection.			
Heat Cramps	- Painful spasms	 Abnormal body posture Grasping the affected area 	- Res - Drin spor Gat - See crar go a	t in cool place. hk water or heavily diluted rts beverage (such as orade). k medical attention if nping is severe or does not tway.		
Severe Heat-Rela	ited Illnesses		1			
Heat Exhaustion	 Weakness Fatigue Blurred vision Dizziness Headache 	 High pulse rate Extreme sweating Pale face Insecure gait Normal to slightly elevated temperature Clammy and moist skin 	 Lay the worker down in a coshaded area; do not leave him/her alone. Loosen and remove heavy clothing that restricts evaporative cooling. Give cool water to drink, aboa a cup every fifteen (15) minutes. Fan the worker, spray with c water or apply a wet cloth to their skin to increase evaporative cooling. Recovery should be rapid. Ca 911 if he/she does not feel better in a few minutes. Do not further expose the worker to heat that day. Have them rest and continue to dri cool water 			
Heat-Related Illness	Symptoms you may experience	Signs to look for in a	others Treatment			
Heat Stroke	- Rapid pulse - Chills - Restlessness	- Rapid pulse - Red face		Get immediate medical help, call 911 for transport to a hospital as quickly as possible.		

FIRST AID

- Irritability	 Hot, dry skin (25% to 50% of cases) Disorientation High temperature (≥104°F) Erratic behavior Shivering Collapse Convulsions Fainting Heat Stroke may resemble a heart attack. 	 If the person is alert and not feeling nauseous, have them sip cool water. Move the worker to a cool, shaded are and remove clothing that restricts cooling. Seconds count: cool the worker rapidly using whatever methods you have available. For example: Immerse the worker in a tub of cool water; Place the worker in a cool shower; Spray the worker with cool water from a garden hose; Sponge the worker with cool water; If the humidity is low, wrap the worker in a cool, wet sheet and fan them vigorously. Continue cooling until medical help arrives If emergency medical help is delayed, call the hospital emergency room for further instructions.

WHEN IN DOUBT, CHILL OUT!

Heat Stroke or Heat Exhaustion: How to tell the difference?

The telling difference is the mental confusion or disorientation that happens to **ALL** heat stroke victims. To assess the level of confusion or disorientation, you can ask these three (3) questions:

- What is your name?
- What day is this?

• Where are we?

If a person cannot quickly answer one or more of these questions, call 911 and take immediate action while waiting for professional help to arrive.

CHEMICAL BURNS

- 1. Protect yourself first with use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. If dry alkali, brush off before rinsing.
- 3. Flood affected area with water for fifteen (15) to twenty (20) minutes or until medical help arrives.
- 4. Remove injured person's clothing without getting chemicals on previously unaffected areas.
- 5. Do not use ointments or butter.
- 6. Do not break blisters.
- 7. Exposures to some chemicals can be deadly. Seek emergency medical aid immediately.

ELECTRICAL INJURIES

Electrical injuries occur due to direct contact with electricity or lightning.

Signs/Symptoms

- Entrance and exit wounds
- Burns
- Fractures
- Respiratory arrest
- Cardiac arrest

Procedures

- 1. Protect yourself first by the use of personal protective equipment found in first-aid kits. Use gloves when exposed to blood and body fluids.
- 2. Ensure that the power source is off or cut and the patient is no longer in contact with the power source. Check person in position found. Don't move.
- 3. Call emergency medical services immediately.
- 4. Administer CPR if person is in respiratory or cardiac arrest.
- 5. Cover burns with dry dressings.
- 6. Splint fractures if medical help is not readily available.

Purpose

To reduce risk to the District, its employees, and its customers through the use of a Business Continuity Plan to mitigate the impacts of disasters through preventive and recovery planning.

A variety of natural, technical and human-caused events could disrupt the District's ability to provide electric and water services, or the critical business functions that support that effort. Examples include earthquakes, fire, terrorism, volcanic activity, or hazardous chemical accidents. Because of the area's geology, earthquakes provide the most probable risk.

Situation

In a disaster scenario, the District may have to operate for some time without normal emergency services such as fire, police, ambulance, and 911. Infrastructure such as highways, bridges, and computer and telecommunications systems may be disrupted as well. These types of disruptions will significantly impact the District's operational ability.

Concept of Operations

The Business Continuity Plan provides centralized coordination of the District's disaster response, recovery and restoration activities. An Emergency Operations Center (EOC) will be activated by the General Manager or his/her designee in response to a disaster. Initially, the District's priority is to provide first aid and emergency care for employees who may be injured. As employees are cared for, the process of assessing damage to District facilities and infrastructure begins so that the magnitude of damage can be determined and the process of prioritizing recovery efforts can begin. As part of the EOC, the District's Communications team will be activated to maintain contact with customers and employees regarding the status of the emergency; and the progress of efforts to restore electric and water service, maintain customer services, assess human resource needs and conduct emergency service operations.

The District's Security & Emergency Management Senior Manager will serve as the director of the Emergency Operations Center and is responsible to assist in the coordination of the District's activities during the declared emergency.

Facilities primary Emergency Operations Center is located in the Commission Meeting Room. The alternate Emergency Operations Center is located in the Central Conference Room of the Operations Center.

Various activities may be temporarily suspended during an emergency and the employees that normally perform that work may be assigned other tasks. The primary responsibilities of a District employee during an emergency is to work safely, maintain their well-being and that of their family, and to report to work when circumstances allow.

If an emergency occurs during working hours, you may be asked to evacuate. Whether you evacuate or remain in your work area, a head count should be taken in each work area to determine missing, injured,

or fatalities. The results should be given to your floor warden or command post manager. First aid should be provided to any injured coworkers. Requests for transportation of the injured should be made by calling 911 or with the coordination of the command post manager through the Emergency Operations Center (EOC).

For further detailed instructions, employees should refer to their "Personal Security & Emergency Response Employee's Guide."

If an emergency occurs during non-working hours, employees should provide for the welfare of family members, and then report to work as soon as possible. Listen to KRKO Radio (1380 AM), KIRO Radio (710 AM), to KOMO Radio (1000 AM) or KING Radio (1090 AM) for information about the need for employees. Roads may be closed or impassable for automotive traffic because of damage to roadways and bridges. Employees should car pool, walk, or ride a bicycle to the closest District office and report to the manager at that location.

Employees reporting to work should bring:

- Employee identification cards
- A water container, water, and a one-day supply of food
- Warm clothing and a change of clothing
- Personal medication and toiletries
- A sleeping bag
- A flashlight

EMERGENCY EVACUATION PROCEDURES

Purpose

To inform and familiarize District employees with building evacuation procedures to be followed in case of an emergency.

Comments

The procedure, if followed during an emergency situation, will provide an orderly and safe exit from District facilities during fire or other crises.

For further clarification of the District's policy, refer to the District's Emergency Operation Plan. This written program can be found throughout the District in department manager locations.

Procedure

Department managers shall ensure that each supervisor familiarizes his/her employees with the location and operations of fire alarm boxes and fire extinguishers in their work area.

Department managers shall ensure that each supervisor familiarize his/her employees with the District's emergency evacuation procedures.

When any District employee observes a fire on the premises (other than a small wastebasket-type fire) that employee shall call the nearest fire department by dialing 911 to report the location of the fire. That

employee is also responsible for notifying other employees by messenger, telephone, activation of fire alarm systems, if available, or whatever other means are necessary.

If the fire is small, such as a wastebasket-type fire, the wall-mounted fire extinguishers available at various locations throughout the buildings should be used. If the fire cannot be extinguished with the contents of one (1) portable fire extinguisher, call the fire department and evacuate the building. Information regarding the proper use of fire extinguishers can be found in the *General Safety Rules* section of this manual.

If the fire alarm system is activated, all employees **MUST** immediately evacuate the building by means of nearest stairway and/or door as indicated in the floor plan illustration of your work area. Close all doors and windows if time permits. Turn off equipment. Leave lights **ON**.

If you are disabled or believe you may need assistance during evacuation, get to know individuals who are willing to help you. Ask them to help you get out or tend to your special needs. Make it your responsibility to find someone to lend a hand.

Following building evacuation, assemble in areas indicated on the floor plan illustration notes and do not reenter the building until notified by your supervisor or floor warden to do so.

HEAVY VOLCANIC ASH FALL WITHIN DISTRICT BOUNDARIES

Purpose

To inform and familiarize District employees with procedures to follow in case of severe volcanic ash fall.

Comments

Fresh volcanic ash may be harsh, acidic, gritty, smelly and thoroughly unpleasant. Fine ash may be slippery. Breathing the ash could cause lung damage. The weight of ash may cause roofs to collapse.

Procedures

The Safety Department will monitor reports of ash fall heading for this area, and if heavy ash fall is imminent, notification to leave work areas for home will be issued before ash begins to fall. Go directly home, do not run errands.

If ash is already falling, stay indoors at work until heavy ash is settled. Close doors and windows. Do not run exhaust fans or air conditioning systems. Do not use the telephone unless it is for an emergency.

If outside, seek shelter (car or building). Use a mask or dampened handkerchief to breathe through. If you must drive, drive slowly. Remember ash fall will reduce visibility. Use windshield wipers and washer. If vehicle stalls, push it off the road to avoid collisions and stay with the vehicle.

Don't panic, stay calm. Listen to the radio for information on the ash fall.

EARTHQUAKES

Procedures

If you are outdoors, stay outdoors; if indoors, stay indoors. In earthquakes, most injuries occur as people are entering or leaving buildings.

During an earthquake, turn away from windows, tell others to seek cover, and get under a desk or table. After the shaking stops, check for fires and dangerous spills. Evacuate only if the situation appears dangerous; the greatest danger is from falling debris at building exits and close to outside walls.

Provide first aid and assist with the movement of the injured. Know where the first-aid kit and emergency disaster supplies are located.

In a vehicle, slow down and drive to a clear spot and stop alongside the road. If you are on a bridge or overpass, or in an underpass, slow down and drive out cautiously, stop alongside the road. Stay in the vehicle until the shaking stops.

Don't use the telephone except for emergency calls. Do not reenter buildings until authorized to do so.

RESCUE (POLE TOP/BUCKET/TREE)

POLE TOP/BUCKET/TREE RESCUE

In an emergency, it is important that the rescuer follow established procedures to effect a quick and efficient rescue of an injured person and render emergency first aid if necessary. The rescuer must make decisions about several factors immediately to protect themselves and prevent further injury to the victim. Above all else, the rescuer must be sure that **they do not become a second accident victim!**

All employees engaged in electrical work, tree work and communication tower work shall receive **ANNUAL** training in rescue and resuscitation.

RESCUE TECHNIQUES

Rescuer alerts rest of crew that an emergency exists.

Rescuer designates one crew member to go for help. (Radio, telephone, do not use the person's name on the radio if possible.)

Clear the person from hazard if necessary. Do not become a second accident victim!

Rescuer's position should be alongside and slightly above the person if possible on the pole.

Protect yourself. Apply necessary personal protective equipment.

Determine person's condition:

- 1. Shake and shout, "Are you all right?"
- 2. Open airway and look, listen, and feel for breathing.
- 3. Check for pulse.
- 4. Proceed to lower person from structure.
- 5. Position hand line on structure above person if possible.
- 6. Rig person with lifeline.
- 7. Remove the slack from hand line; the person on the ground takes up the slack.
- 8. Take a firm grip on the hand line.
- 9. Remove safely and lower the person, guiding him/her past anything on the way down. The person on the ground can control the rate of descent by turning the rope around an object on the ground.
- 10. **If person is conscious** and able, follow procedures 5 through 8 except feed enough slack in line to allow climbing freedom and assist down the structure.
- 11. Do not leave the person alone, even if they say they are all right. IMPORTANT!
- 12. Aerial equipment may be used if it is immediately available.
- 13. If the person is seriously injured or unconscious and in aerial equipment, follow steps 1 through 11. Then, after rigging the person with the hand line, the operator should lower the bucket away from the injured person and the person lowered on the hand line.

14. Because the person might be unable to operate the aerial equipment, all crew members shall be familiar with aerial controls and location of release valves and shall be able to operate controls to bring the aerial equipment to a point where the person may be removed, then administer the appropriate first aid.

TOWER RESCUE PLAN

When climbing any tower 100% percent fall protection must be maintained at all times.

Scope

This procedure is intended to inform all personnel of techniques involved during elevated tower work so they can perform their work safely. This procedure is applicable to all employees and is a recommended guidance for District employees who perform elevated tower work where a fall hazard of four (4) feet or more exists. All equipment used for fall protection shall comply with ANSI Z359.1 or be approved by a qualified person. All employees performing elevated tower work must have formal tower safety and rescue training as specified by company policy. For all work performed at heights four (4) feet or above, rescue equipment will be readily available prior to performing the assigned job task.

Purpose

To ensure all personnel performing elevated tower work are prepared in an emergency to provide assistance and /or remove an injured employee from an elevated workstation.

Rescue Plan

To ensure all hazards, control measures and rescue information is communicated to each employee, prior to work, the tower crew will hold a tailboard meeting where the crew shall review the site emergency information and job site assessment (JSA) in addition to the job hazard in the scope of the work (job briefing) including the following:

- Rescue method and equipment to be used
- Location of first-aid kit, phone and rescue equipment
- In-depth job site location information
- Directions for emergency service to access the job site
- All emergency numbers and available addresses to the nearest emergency service locations.

The attached Tower Climbing Work Plan Tailboard Checklist shall be completed during the tailboard meeting.

Crew Size

When climbing District towers, the crew size shall be a minimum of three (3) tower-qualified personnel with one person as the ground person. All persons on the crew shall have their climbing equipment onsite.

COMMUNICATION TOWER RESCUE

In an emergency, it is important that the rescuer follow established procedures to ensure a quick and effective rescue of an injured person and render emergency first aid if necessary. The rescuer should get the injured person to the ground as soon as possible. Use good judgment and common sense and **do not become a second victim**. In an emergency the working/haul line may be used for rescue.

Rescue Steps

In the event of a fall incident, regardless of the medical condition of the employee, the foreman or lead person will call **Energy Control Center (ECC)** and give them adequate information to prepare for the situation emergency response will encounter upon arrival.

In the event a climber is unable to remove himself from the tower, the following procedures will be followed to ensure that the employee receives adequate and timely response.

- Notify **Energy Control Center (ECC)** of the emergency. (GPS coordinates and site address are posted at all communication sites). Familiarize yourself where these sites are located when you arrive.
- The lead person will obtain all rescue equipment and take measures to get to the rescuer.
- If you have fallen, try to relax. Most often you will be able to reach out and take hold of the tower. Sometimes with a small swing you can reach the tower. If the distance is too great or you are hurt, just relax. Remember to breathe evenly and remain calm until help arrives.
- If you see a climber fall or sustain an injury, you must first secure your work to prevent creating any additional hazard. Secure any materials and tools you are using, detach them from your belt and attach them securely to the tower to prevent hindering your movements.
- When a climber has fallen and is suspended in an easily accessible position, you may find that manually reaching out and pulling the climber back into the tower is the best rescue technique. Be careful to follow all safe climbing procedures.
- Don't let the situation cause you to get careless and become a second victim. Upon reaching the fallen climber, attach your positioning lanyard and fall-restraint lanyard, then physically help the fallen climber back to the safe perch on the tower. Use caution and make sure the climber is calm before reaching out so he or she doesn't pull you off the tower. Accompany the climber to the ground using the buddy system, and administer first aid as appropriate.

Climber has Fallen/Suspended and Can't Reach Out

- When a climber has fallen and is suspended in a position where you can't reach out and pull the climber back to the tower, use an approved descent device to descend to the climber.
 First, rig the descent line above and as close as possible to the victim's position.
- A separate lifeline will then need to be rigged next to the descent line. Rig the descent device and attach to the front D-ring on your harness using a carabiner. Attach the rope grab to the back D-ring on your harness, and then attach it to the lifeline. Be sure to attach to the lifeline before disconnecting fall arrest from the tower.
- Descend to the fallen climber to a point with access to the victim's back or front D-ring. Use care to position slightly above the victim's D-ring. This minimizes the victim's weight dropping on the rescuer connection when the victim is released from the attachment.
- The rescuer then attaches a large carabiner to the fallen climber's back or front D-ring and also to the carabiner attached to the descent device. **Caution: Do not attach the following climber's carabiner to the D ring on the rescuer's harness.** This puts the weight of the fallen climber onto your descent line rather than on your harness.

POLE TOP / BUCKET / TREE RESCUE

• At this point, the rescuer must release the victim from the attachment point. Once a victim is free from the rope and or lanyard, the rescuer then lowers the victim and himself to the ground and first aid is administered.

Post-Rescue

The site and all equipment should be secured until a proper accident investigation can be performed.

Definitions

- Anchor: A required means of attachment to which the fall-protection system is connected.
- Attachment: A device such as a tie, ban, or fastening that joins one thing to another.
- **Carabiner:** A connector component generally comprised of a trapezoidal or oval-shaped body with a normally closed gate or similar arrangement that may be open to permit the body to receive an object, and when released, automatically closes to retain the object.
- **Climbing:** The vertical (ascending and descending) and horizontal movement to access the elevated work position. A climber must be mechanically attached doing all climbing, work, or rest activities.
- **Competent Person:** One who, because of training, experience, and authority, is capable of identifying and correcting hazardous or dangerous conditions in the personal fall arrest system or any component thereof under consideration, as well as its application in use with related equipment
- **Deceleration Device:** Any mechanism which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on employee during fall arrest.
- **Fall Arrest System:** The assembly of equipment such as full body harness in conjunction with a deceleration device and anchor to limit the forces a worker experiences during a fall from one elevation to another.
- Fall Prevention System: A system intended to prevent a worker from falling from one elevation to another. Such systems include positioning device systems, guardrail, barriers, and restraint system. Fall prevention systems are used in an attempt to prevent workers from falling from an elevation. It should be noted that these devices do not absolutely prevent a worker from falling; their function is to keep the worker at the same elevation.
- **Full-Body Harness:** A component with a design of straps fastened about the worker in a manner so as to contain the torso and distribute the fall arrest forces over at least the upper thighs, chest and shoulders with means for attaching it to other components.
- **Hazard:** Anything that could potentially endanger personnel, impact safe working conditions, or conceivably cause injury or loss of life.
- **Job Site:** The assembly point at the structure or equipment where the workers, tools, or vehicles are assembled to perform climbing to the work position.
- **Lanyard:** A flexible line of rope, wire rope, or strap that generally has a connector on each end for connecting the body or body harness to a deceleration device, lifeline, or anchor.
- **Portable Ladders:** Ladders that are not permanently installed to a structure but are the normal means of accessing the facilities on the structure as well as the structure itself.

Qualified Climber: A worker who has been certified through District- approved training, has current CPR/ first aid training and understands the methods and has routinely demonstrate proficiency in climbing.

POLE TOP / BUCKET / TREE RESCUE

TOWER CLIMBING WORK PLAN

TAILBOARD CHECKLIST

COMPLETE THIS CHECKLIST AS PART OF YOUR PRE-CLIMB TAILBOARD MEETING.

- Verify minimum three (3) members for the tower-climbing team and that all member's tower climbing and tower rescue certifications are current.
- Record location details available (what responders need to know)
 - Route to Tower:

Site Name/Description:

GPS Coordinates/Site Address:

Location of nearest emergency services:

_____ Discuss and review the physical environment.

- _____ Determine the proximity of a first responder team.
- ____ Does 911 work at the climb location? If not, do you have confirmed radio contact with someone who can call 911?
- ____ Discuss the details of possible rescue method(s) that may be required:
 - ➢ Will the victim be clear of obstructions when lowered?
 - ➤ Will the lifeline deploy correctly?
 - ➢ Is the lifeline long enough?
 - > Can you see the victim through the entire rescue operation?
 - Identify appropriate anchor points for rescue equipment (rated > 3100 pounds)
- _____ Verify the following on hand, in good working order and ready to use:
 - ▶ Rescue devices to raise/lower victim such as a controlled rate descent device.
 - Ropes and lifelines rated for rescue and evacuation
 - Rolling edge protectors or Velcro edge protectors to protect the rope from sharp edges and abrasion.
 - Anchor straps and carabiners for making an anchor when one is not available or convenient.
 - ➢ First-aid kit and defibrillator (AED).

JACKSON TOWER WORK PROCEDURES

This procedure will apply to all work performed by Jackson Project Staff on communication towers located within the confines of the Jackson Hydroelectric Project.

Routine work will be defined as any work accomplished from platforms containing handrails or ladders with fall-protection devices or cage. While performing routine work, employees will use full-bodied harnesses with 100% fall arrest, ladder cable grab, and hard hat. Personnel lowering devices with sufficient rope length to perform a rescue from the highest point of the tower will be on the jobsite before tower climbing begins. This equipment will be visually inspected and adjusted for each day's operation (Bashlin 700SRK uses 1.5 wraps for persons up to 200 lbs. and two (2) wraps for persons 200 lbs. to 250 lbs.). Defective equipment shall be taken out of service and turned in for repair or replacement. (Fall Arrest/Restrained WAC. 296 — 155-24510)

JACKSON TOWER RESCUE

First aid may be provided on elevated platforms by first-aid-trained workers before lowering the victim. The use of both common sense and good judgment are imperative in emergency situations. Rescue or removal of individuals from tower/platforms will be achieved using individuals trained in the use of personnel lowering devices and ground helper/helpers if needed. Emergency response team (911) will be notified of the situation if additional help is needed.

Personnel Lowering Device:

Such as but not limited to:

- Capewell Evac-Pack
- Bashlin 700SRK
- Fisk Descender
- Bashlin 52004 Para-Pack
- 300 feet life line
- 300 feet block and tackle
- Full-body tower harness

POLE TOP RESCUE ILLUSTRATIONS







VAULT, SUBSTATION EMERGENCY RESCUE

In an emergency, it is important that the rescuer follows established procedures to effect a quick and efficient rescue of an injured person and render emergency first aid if necessary.

The rescuer must make decisions about several factors immediately to protect themselves and prevent further injury to the victim. Above all else, the rescuer must be sure that they **do not become a second victim!**

All employees engaged in electrical work, tree work and communication tower work shall receive **ANNUAL** training in rescue and resuscitation.

UNDERGROUND VAULT OR ACCESS HOLE RESCUE

Rescue Techniques

Rescuer alerts rest of crew that an emergency exists.

Rescuer designates one crew member to go for help. (Radio, telephone, do not use person's name on radio if possible).

Rescuer determines if situation is hazardous or non-hazardous (i.e., fire, gases, no oxygen, electrical, etc.).

If hazardous conditions exist, rescuer must protect self and clear person from hazard if possible. **Do not become a second accident victim!** Removal from vault or access hole is accomplished before emergency first aid is given.

If non-hazardous conditions exist, rescuer should administer emergency first aid before removal from vault or access hole.

Protect yourself. Use necessary personal protective equipment. Use gloves, breathing device, etc.

Immediate Danger to Victim or Rescuer

- 1. Rescuer protects self and clears the person from the hazard.
- 2. Crew member places ladder, hand line, or winch line into vault. Use whichever of three (3) methods are suitable for condition.
- 3. Rescuer rigs person for removal from vault.
- 4. Rescuer calls for assistance to lift the person out of the vault.
- 5. After removal from vault, lay the person on a hard level surface and determine condition. Give emergency first aid as needed.

SUBSTATION STRUCTURES

Rescue Techniques

Rescuer alerts rest of crew that an emergency exists.

VAULT RESCUE

Rescuer designates one crew member to go for help. (Radio, telephone, do not use the person's name on the radio if possible.)

Clear the person from hazard if necessary. Do not become a second accident victim!

Rescuer's position should be alongside and slightly above the person if possible.

Protect yourself. Apply necessary personal protective equipment.

Determine person's condition:

- 1. Shake and shout, "Are you all right?"
- 2. Open airway, look, listen, feel for breathing.
- 3. Check for pulse.
- 4. Proceed to lower person from structure.
- 5. Position hand line on structure above the person if possible.
- 6. Rig person with hand line.
- 7. Remove the slack from hand line; if alone, take both lines in hand; if not, the person on the ground takes up the slack and takes a firm grip.
- 8. Lower the person, guiding them past anything on the way down. Use the other hand to control the rate of descent if alone; otherwise, person on the ground can control the rate of descent by turning the rope around an object on the ground.
- 9. If the person **is conscious,** follow procedures 5 through 8 except feed enough slack in line to allow climbing freedom and assist down the structure.
- 10. Do not leave the person alone, even if they say they are all right. **IMPORTANT!**
- 11. Aerial equipment may be used if it is immediately available.
- 12. After removal from structure, lay person on a hard level surface and determine condition. Give emergency first aid as needed.

SUBSTATION TRANSFORMER, REGULATOR RESCUE PROCEDURES

Preliminary Procedures

Always have a hand line available and a ladder against a transformer, large regulator, or circuit breaker while working on this type of equipment.

SUBSTATION TRANSFORMER RESCUE

In the event of an emergency on top of a substation transformer requiring immediate action, rescuers must follow established procedures to ensure a quick and efficient rescue of an injured or unconscious worker.

All substation personnel shall receive **ANNUAL** training in rescue and resuscitation. The rescuers must get the worker to the ground as soon as possible using the following procedure:
VAULT RESCUE

- 1. Notify Energy Control Center (ECC) and/or 911. Call for the rescue kit.
- 2. Rescuer #1, on top of the transformer, attaches the pre-rigged rescue line to the anchor point above the victim.
- 3. Attach the free carabiner on the rescue line to the victim's D-ring.
- 4. On the ground, the 2nd rescuer will rig the descent device to the lower anchor, ensure it is rigged properly and then take the slack out of the load line.
- 5. Remove the victim's weight off the shock-absorbing lanyard so it may be removed by pulling down on the load line.
- 6. Rescuer #2 will lower the victim off the transformer using the descent device. Rescuer #1 will position themselves alongside and slightly above the victim on the ladder to guide them around obstacles as they are lowered to the ground.
- 7. Aerial equipment may be used if it is **immediately** available.
- 8. When victim is on ground, remove rescue line from the D-ring and begin CPR/first aid

Equipment used for Substation Transformer Rescue such as but not limited to:

- Buckingham Tower Rescue Kit
- CMC Rescue Multi-Purpose Device
- Petzl I'D
- DBI Sala

In Transformer

After checking that there are no harmful gases, follow the procedures outlined under *Rescue Techniques for Underground Vaults*.



VAULT RESCUE



ROPE & CABLE

Wire rope shall be used in accordance with the following:

WIRE ROPE AND RELATED RIGGING

Wire rope shall be inspected for broken or damaged strands before every lift or pull, including raising or lowering a conductor, hoisting heavy tower steel, etc.

A thorough annual inspection of hoisting equipment shall be made. Records of dates and results shall be maintained.

Rope should be discarded, or damaged sections cut off, if more than ten (10) wires have been broken in one rope lay (distance along the rope required for one strand to encircle the rope), or five (5) broken wires in one (1) strand in one (1) lay.

In the case of ropes subjected to long or rough usage, this number may be reduced to reflect other incidental damage, such as crushing, nicks, lesser damage in other strands, corrosion, etc.

Wire ropes shall be removed from service when there is wear of one-third (1/3) the original diameter of the outside wire or evidence of heat damage from any source.

Running wire rope shall be removed from service when the following reductions from nominal diameters are present:

- More than 1/64" in nominal diameters through 5/16"
- More than 1/32" in nominal diameters 3/8" through 1/2"
- More than 3/64" in nominal diameters 9/16" through 3/4"
- More than 1/16" in nominal diameters 7/8" through 1 1/8"
- More than 3/32" in nominal diameters 1- 1/4" through 1- 1/2"

Standing ropes shall be replaced when either more than two (2) broken wires in one (1) lay in sections beyond end connections are found, or more than one (1) broken wire when an end connection is present.

Safety Factor

The ratio of the ultimate breaking strength of a rope to its maximum safe working load is the safety factor. This factor must be sufficient to assure a reasonable margin of strength above the safe working load so that unpredictable or uncontrollable circumstances which may weaken the rope or subject it to impact loads will not result in the failure of the rope. The maximum safe working load shall be determined by dividing the related ultimate strength of new wire rope by the applicable safety factor.

The factor of safety for wire ropes used in conductor stringing operations (or others where severe impact loads cannot occur) should not be less than three (3). (See *Wire Rope* in *Data* section.)

The factor of safety in lifting operations where danger to life and property or severe impact loads may occur should not be less than five (5). (See *Wire Rope* in *Data* section.)

Slings and chokers should have a safety factor of five (5).

WIRE ROPE SPLICES

Only wedged eye splices or properly installed compression splices may be used on District equipment. All splices must be made by qualified personnel.

Shackles

The size of any shackle is determined by the least diameter of the shackle body rather than by the dimension of the pin.

The shackle used must be at least one-quarter (1/4) inch larger than that of the rope with which it is used.

Blocks and Sheaves

Anti-friction bearings, bushings, and pins in all blocks and sheaves shall be inspected before any lift is made discarding those items or parts that are excessively worn and are not functioning properly.

RIGGING EQUIPMENT FOR MATERIAL HANDLING

General

Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be repaired or discarded.

Rigging equipment shall not be loaded in excess of its recommended safe working loads as described in the *Data* section.

Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.

Makeshift links or fasteners formed from bolts or rods, or other such attachments, shall not be used.

Alloy Steel Chains

Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity and sling manufacturer.

Alloy steel chains and attachments shall be inspected daily before use by a competent person for damage or defects.

Alloy steel chains shall be thoroughly inspected annually, or more frequently, depending on the frequency, severity and nature of the lifts being made.

Hooks, rings, oblong links, and pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, shall have a rated capacity at least equal to that of the chain.

Job or shop hooks and links, or makeshift fasteners formed from bolts, rods, etc., or other such chain attachments, shall not be used unless designed and certified by a registered professional engineer as being adequate for the application and meeting the requirements of the standard.

Rated capacity (working load limit) for any alloy steel chain sling shall conform to the values shown in the *Data* Section. Whenever wear at any point of chain link exceeds that shown in the *Data* section, the assembly shall be repaired or discarded.

Wire rope slings shall be immediately removed from service if wear or scope of one-third (1/3) the original diameter of the outside wire exists.

Rope (Wire, Synthetic and Fiber)

The *Data* Section shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire slings with various types of terminals. For sizes, classifications and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products shall be followed, provided that a safety factor of not less than five (5) is maintained.

Wire rope shall not be secured by knots.

The following limitations shall apply to the use of wire rope:

- An eye splice made in any wire rope shall be the wedged or compression type. However, this requirement shall not preclude the use of another form of splice or connection which can be shown to be as efficient that is not otherwise prohibited.
- Except for eye splices in the ends of wires and for endless rope slings, each wire used in hoisting or lowering, or in pulling loads, shall consist of one continuous piece without knot or splice. Eyes in wire rope bridles, slings, or bull lines shall not be formed by wire rope clips or knots.
- Wire rope shall not be used if six (6) randomly distributed broken wires in one rope lay, or three (3) broken wires in one (1) strand. Any wire rope strings having kinking, crushing, bird caging or any other damage resulting from use shall be immediately removed from service.
- Wire rope slings shall be removed from service if they exhibit evidence of heat damage or are deformed, cracked or have worn end connections.
- When U-bolt wire rope clips are used to form eyes, the *Data* section shall be used to determine the number and spacing of clips. When used for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the wire rope.
- Hooks with cracks, or having more than 15% in excess of normal throat opening or more than 10 degree twist from the plane of the unbent hook, shall be removed from service.

Fiber and Synthetic Rope

Rope shall not be dragged over rough or sharp objects.

Short bends should be avoided over sharp-edged surfaces or when lifting.

Kinks shall be removed before any strain is applied.

Rope shall be dried and stored properly, free from mechanical damage and excessive heat and dryness.

Rope shall be examined prior to use for cuts, worn spots, burns and rot. The outward appearance of the rope shall not be accepted as proof of quality or strength. The rope shall be untwisted at various places and inspected for poor fiber and dry rot.

Natural and synthetic fiber rope slings shall be removed from service if there is powdered fiber between the strands.

Polyester and polypropylene web slings, and ropes shall not be used where fumes, vapors, sprays, mists or liquids of acid or phenolic are present.

Natural and synthetic fiber rope shall be removed from service if it exhibits variations in the size or roundness of the strands, or if there is distortion in the sling hardware.

Hand lines shall be a minimum of one-half (1/2) inch diameter and have a minimum strength of 2,385 pounds. Hand-line blocks, snaps and hooks shall have a minimum safe work load of 500 pounds.

Safety Factor

A must of rope usage is to always allow an ample margin of safety in the strength of rope to be used for any given load or pull. For general industrial work with a first quality rope, a safety factor of five-to-one is recommended. That is, the minimum tested breaking strength of a rope should be at least five (5) times the amount of strain, in pounds, to be placed on it. These minimum breaking strengths for three-sixteenth (3/16) inch to one (1) inch diameter are given in the *Data* section.

The angle of pull on a rope sling has a good deal to do with its efficiency and safety. What isn't well known is **HOW** wide angles of a pull can greatly increase the strain on a sling. If an accident occurs, the user might wonder why a rope with a stated tensile strength of 6,500 pounds broke in lifting a 2,000 pound load. The answer might be that the angle of pull was too great. For example, if the sling angle was 150 degrees, the strain on the sling would be 7,728 pounds when lifting the 2,000 pound load.

Shackles and Hooks

The *Data* Section shall be used to determine the safe working loads of various sizes of shackles. Higher safe working loads are permissible when recommended by the manufacturer for specific operation, provided that a safety factor of not less than five (5) is maintained.

The manufacturer's recommendation shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. A record of the dates and results of such tests shall be maintained.

All hooks and shackles are stenciled with the manufacturer's recommended rating. If a hook or shackle is not stenciled, it must be taken out of service and disposed of in an approved manner.

The following diagram shows the different weights of pull exerted on slings at various angles and in all cases for the same 1,000 pound load. Note that the load on the rope is the same as the load being lifted ONLY at zero-degree angle, or a straight pull. At a 120 degree angle, the load on the sling is doubled.



FORKLIFTS - INDUSTRIAL TRUCKS

Only attachments provided by or approved by the manufacturer may be used. Such attachments shall be properly secured. Improvised methods shall not be used. Any modifications or additions that affect the capacity and safe operations must be approved in writing by the manufacturer.

If equipped with other than factory-installed front-end attachments, the specification plate shall be clearly marked to identify the attachments and the load height parameters and limitations.

No one shall be allowed to ride the fork, forklift, or other equipment other than the operator, except when seats are provided for this purpose.

When an industrial truck is left unattended (operator is more than fifteen (15) feet away or the vehicle is not in view), the load-engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off and brakes set. Wheels shall be chocked when the truck is parked on an incline.

Equipment with internal combustion engines shall not be operated in enclosed areas for prolonged periods of time so as not to exceed the allowable levels of carbon monoxide.

When loading or unloading trucks, approved dock boards that are properly secured shall be used. The wheels of the truck shall be blocked.

Forklift extensions shall be clearly labeled with the maximum safe work load and secured to the lift bar in an approved manner.

Industrial trucks shall be operated only by authorized persons who are qualified and trained in their use.

The Forklift Operator's Checklist shall be completed before operating any forklift or industrial truck at the start of each shift. *See copy at end of this segment*.

Brakes and controls shall be tested prior to use. Equipment with faulty brakes or mechanical or electrical defects shall not be operated. Needed repairs shall be reported immediately to your foreman or supervisor.

Equipment shall always be operated at a safe speed for existing conditions.

Industrial trucks shall not be fueled with the engine running.

Before moving the equipment, the operator shall make sure that no person or objects are in the path of the vehicle. Clearances in all directions shall always be checked, particularly overhead clearances.

FORKLIFTS - INDUSTRIAL TRUCKS

When picking up a load, forks shall be set squarely and as far as possible under the load. Loads should not be raised or lowered while traveling. Whether loaded or empty, forks should be carried as low as possible but high enough to clear uneven surfaces.

Loads shall not be suspended or swung over people. No one shall be allowed to stand or walk under elevated forks.

The operator shall always face in the direction of travel.

On inclines, all types of loaded lift trucks shall be driven with the load on the upgrade side of the driver whether ascending or descending.

Sudden stops which might spill the load shall be avoided.

All loads shall be securely fastened or safely positioned to prevent tipping or falling.

Lift bars on forklift trucks that are movable or replaceable shall be firmly in place by a proper securing pin. Jury-rigged devices, such as using a threaded bolt, shall not be permitted.

If a forklift is going to be used for elevated work platforms, you must follow the following guidelines:

- The structure must be securely attached and have toe boards and handrails
- A safety strap shall be installed or the control lever locked to prevent the boom from tilting with the hydraulic system designed so that the lift mechanism will not drop faster than one-hundred and thirty five (135) feet per minute
- An operator shall be in attendance while the workers are on the platform and in the normal operating position while it is raising or lowering
- The forklift shall not be moved while workers are on the platform
- The area between the workers on the platform and the mast shall be guarded to prevent contact with chains or shear points.

For employee fall protection, see *Fall Arrest/Restraint* section.

Forklift Operator's Check sheet

THIS CHECKSHEET IS TO BE COMPLETED BEFORE OPERATING ANY FORKLIFT AT THE START OF EACH SHIFT, REPORT ANY DISCREPANCIES, OTHER THAN FLUID LEVELS, TO YOUR FOREMAN OR SUPERVISOR IMMEDIATELY.

OPERATOR		DATE				
FORKLIFT NUMBER	HOUR METER READING					
	noonin					
VISUAL CHECKS:	ОК	LOW/ADDED	NOT OK			
Engine Oil Level						
Radiator Water Level						
Fuel Level						
Obvious Damage & Leaks						
Gauges & Instruments						
Fire Extinguisher						
Tires/Wheels						
OPERATIONS CHECKS:						
Steering						
Horn						
Head & Tail Light						
Brakes						
Hydraulic Controls						
Up/Down						
Right/Left						
Hydraulic Hoses						
REMARKS: (Please explain the problem with any item yo	ou marked NOT OK)					
Operator's Signature		Date:				
Foreman's Signature		Date:				

CRANES, DERRICKS, HOISTING EQUIPMENT

While performing construction work, only state-certified crane operators shall operate cranes with a lifting capacity of more than two (2) tons with the exception of an electrical-rated digger derrick and crane with a fiberglass boom section. State certification is not required when operating a digger derrick and crane to perform maintenance work. In all cases the operator must have the necessary training to safely operate the digger derrick and crane.

Only authorized persons shall be permitted in the cab or on the equipment. Only those designated persons who are trained and qualified shall operate the hoisting equipment.

An accessible fire extinguisher of at least five (5) pound ABC or BC rated shall be available at all operator stations. Refer to *General Safety Rules* section for proper use and handling of fire extinguishers.

No modifications or additions that affect the capacity or safe operation of the hoisting machinery shall be made without the manufacturer's or registered professional engineer's written approval.

The upper limit switch of each hoist shall be tested at the beginning of each operator's shift.

The crane shall not be loaded beyond its rated capacity. A chart indicating the manufacturer's rated capacity at all operating radius for all permissible boom lengths, with alternate ratings for optional equipment affecting such ratings, shall be posted in all mobile-type cranes readily visible to the operator in the normal operating position.

No person shall be permitted to ride the hook, sling, or load of any hoisting equipment.

Load limits, as specified by the manufacturer, shall not be exceeded under any circumstances. Attachments used with hoisting equipment shall not exceed the capacity, rating or scope recommended by the manufacturer.

Operating and maintenance procedures, as specified by the manufacturer, shall be followed. The mobile crane shall be equipped with a boom angle indicator. Rated load capacities, recommended operating speeds, and special hazard warnings or instructions shall be visible to the operator while at the control station.

For the first lift of each day, a competent person shall inspect all machinery and equipment prior to each use and periodically during use. Any deficiencies shall be repaired, or replaced, before continued use. The load shall be test-lifted and the brakes checked (load lifted several inches and then tested).

All functional operating parts and the crane shall be inspected prior to use for any maladjustment, leaks in lines, tanks, valves, drain pumps and other parts of the hydraulic system.

Hoisting machinery shall be thoroughly inspected annually by a competent person or by a government or private agency recognized by the Department of Labor and Industries.

When necessary for rigging or servicing requirements a ladder or steps shall be provided to give access to the cab roof.

With every load, the slings and bindings shall be checked and readjusted as necessary to insure safety and stability.

Hooks shall be visually inspected prior to use and inspected monthly with a signed report listing any cracks more than 15% of excess in normal throat opening or with more than 10% twist from the plane of the unbent hook.

Hoist and load attachment chains, rope slings and running ropes shall be visually inspected monthly with a signed report listing any excessive wear, twist, distorted links interfering with proper function, broken wires, stretch, kinking or twisting.

All slings and other fittings shall be of sufficient strength, proper type and in good working condition for their intended use. All hooks, including crane hooks, shall be of the safety latch type or moussed on.

Signals to the equipment operator shall be given by a person designated to perform this task. The operator will, however, obey a **STOP** signal given by anyone.

A tagline or guide rope shall be used on all loads that swing freely and held by an experienced person.

If exposed to employee contact, all belts, gears, chains, sprockets, pulleys, shafts, cones, etc., shall be guarded.

No employee shall be under a suspended load or inside the angle of a winch line. No employee shall stand or work near a cable, chain or rope under tension unless the nature of the work requires it.

Winch lines, ropes or wire cables shall not be guided by hand when standing within reach of the drum or sheave. See *Rope* section for specific rope requirements.

All jibs shall have positive stops to prevent their movement more than five (5) feet above the straight line of the jib and boom on conventional type crane booms. Cable-type belly slings do not constitute compliance with this requirement.

Wire rope loops shall be made by proper splicing or mechanical clamping of the tail section. Knots shall not be used in wire ropes for any purpose.

Operators shall not leave their position at the controls of cranes, hoists, derricks or other lifting devices while the load is suspended.

A minimum clearance distance of thirty (30) inches shall be maintained between the swing radius of the greatest extension of the crane super-structure or counterweight and a stationary object, including the crane itself, or suitable barriers or safeguards shall be used to isolate the pinch point hazard area.

Positive boom stops shall be provided on all mobile cranes of the wheel and crawler type.

The length of crane boom and amount of counterweight shall not exceed the manufacturer's rated capacity for the equipment involved.

All mobile cranes shall be equipped with a positive operating fowl or dog on the hoist and boom drums that shall be used, in addition to the brake, to hold the load and boom when they are suspended. Although the District does not own this type of crane, one could be rented, however, this type of crane would also require an authorized operator if used.

Cranes or shovels setting on steep grades shall be securely blocked or secured with a tail hold. When moving the load, the crane shall be level and, where necessary, properly blocked.

When mobile hoists, cranes or similar lifting devices are used near energized lines or equipment, the lifting device shall be properly grounded, or considered as energized and barricaded.

Cranes shall not be used for side pulls.

Operators of cranes, derricks, hoists and other hoisting equipment shall exercise extreme caution when in close proximity to energized lines or equipment.

For competent crane operators performing power transmission or distribution construction, refer to the *Transmission/Distribution/Substation* section for applicable clearance requirements.

For crane operators not proficient in the hazards associated with power transmission or distribution construction and maintenance, minimum clearance distances shall be: 10 feet - up to 50 kV, 10 feet plus 0.4 inch for each 1 kV over 50 kV, 12 feet 2 inches for 115kVm 10 feet for 7,200 kV, and 10 feet for 12 kV.

Trucks on which derricks or booms are erected above traveling height shall not be moved except under the immediate direction of a designated employee, who shall give his/her undivided attention to the movement.

See Data section for Standard Hand Signals for Cranes.

FALL ARREST/RESTRAINT

The District has several areas in which a fall hazard may exist; therefore fall protection shall be provided and used by employees that are at risk. This section addresses specific site fall protection. The areas that fall protection must be provided for are:

All roof areas that will require an employee to approach within six (6) feet of the roof edge.

All ladder work that requires an employee to work more than twenty-five (25) feet above the floor level. The ladder must be secured and the person on the ladder shall be secured to the ladder. However, if any ladder work is being performed that requires the use of both hands, the ladder shall be secured and the employee must be secured by use of a body belt or harness.

When working out of a hi-lift, forklift, or genie lift, a body harness shall be worn and fall arrest system used and attached to a boom support/anchor point. See *Forklift* section "I" page 2.

When working from scaffolds or ladders above ten (10) feet from the ground, a form of restraint shall be worn and attached to a fall restraint or fall arrest system, such as a rope gripper, which is designed to stop the fall.

All scaffolding work that requires an employee to work more than ten (10) feet above the floor level.

Fall restraint protection shall be rigged to allow the movement of employees only as far as the edges and sides of the walking surface.

Body harness fall arrest systems shall be rigged to limit any free-fall to a maximum distance of six (6) feet.

Preventative Measures

When an employee is to work on a roof in excess of four (4) feet in height and within six (6) feet of the edge, they shall wear a safety harness and have a fall-restraint lanyard and a safety monitor or a fall arrest system line attached to roof tie-downs or to a horizontal lifeline attached to two (2) anchor points. An employee will not be assigned to work on the roof until they have been fully instructed in the use of the body harness and fall arrest systems.

EXCEPTION: When an employee is to work on a low-pitched roof (less than 4 in 12), a warning line shall be erected to identify the approach to the control zone. If only on the roof to inspect, investigate or estimate roof-level conditions, employees are exempt from fall protection.

When an employee utilizes a ladder for work that exceeds ten (10) feet in height, the top three (3) rungs shall not be used to stand on or to work from. Ladders used for access shall be secured on the top and bottom and extended thirty-six (36) inches above the work area.

When overhead work is in progress that presents a risk of falling material, the area shall be cordoned off, or barricades erected to prevent personnel from entering the area. Those working in the area shall be required to wear a hard hat.

Equipment

The equipment used to provide fall protection shall be OSHA approved and tested at frequencies required by industry standards.

The manufacturer's service or product sheet shall be available at all times to ensure that the equipment is properly assembled and serviced.

After use, all equipment shall be inspected to verify it has not been damaged. The equipment shall again be inspected prior to the next use by the individual designated to inspect the equipment for the department. Document by checklist on the work plan.

All safety equipment used for fall protection shall be stored in a dry area and in a fashion that will not cause damage to the components.

Personnel

All employees using fall protection shall be instructed in the proper assembly and use of the equipment and the Fall Protection Work Plan.

All employees working in an area where overhead work is taking place shall wear hard hats. Any other personnel in the immediate area shall also be required to wear hard hats or vacate the area. A copy of the Fall Protection Work Plan shall be available at the job site at all times.

Injuries

In the event of a fall in which an employee has been injured, the Energy Control Center shall be called. After the dispatchers have been notified, ensure that the injured person remains quiet and provide appropriate first aid until they have been checked by medical personnel.

HI-LIFT POLICY AND GUIDELINES

Management

The Facilities Manager will ensure qualified personnel maintain and operate the hi-lift. The following records will be maintained and retained for a minimum of three (3) years:

Written records of the annual inspection and interval inspections.

Written record of all repairs accomplished on the aerial platform.

The names of all personnel (within the Facilities department) trained in the maintenance of the unit.

The names of all operators (within the Facilities department) trained on the use of the aerial platforms.

Operators

Operators are responsible for operating the aerial platform within the provisions outlined in the operator's manual. They are responsible for ensuring all personnel on the aerial platform comply with the provisions outlined in the operator's manual.

Operators shall adhere to the following practices:

- The aerial platform is operated on a surface within the limits specified by the manufacturer.
- Any outriggers, stabilizers, extendible axles or other stability-enhancing means are employed and utilized as required by the manufacturer.
- All guard rails are installed and access gates or openings are closed per the manufacturer's instructions.
- Any load and its distribution on the platform and any platform extensions employed are in accordance with the manufacturer's rated capacity for that specific configuration.
- There is adequate clearance from overhead obstructions.
- The minimum safe-approach distances to energized power lines and parts listed in the operator's manual are maintained.
- All personnel on the platform wear fall protection devices and other safety gear, as required (when working above six [6] feet).
- All occupants will maintain firm, level footing on the floor of the platform. The use of mid-rails, top rails, and ladders, boxes, or any other means to enhance vertical reach shall not be used. The use of planks or other devices to accommodate further horizontal reach shall not be used.
- Proper allowance will be made for other moving equipment or vehicles present.
- Problems or malfunctions that become evident during the operation are immediately reported to the maintenance lead. Problems or malfunctions that affect the safety of the operation shall be reported to the maintenance lead and repaired prior to continued use.
- There shall be no altering or disabling of interlocks or other safety devices.
- Under all travel conditions (if applicable), speed is limited according to ground surface, congestion, visibility, slope, location of personnel and other factors which may cause collision or injury to personnel.
- Ensure the device provided by the manufacturer to protect against usage by unauthorized personnel is actuated upon leaving the aerial work platform.
- There will be no modification of the aerial platform without written approval from the manufacturer.

FALL ARREST / RESTRAINT

FACILITIES DEPARTMENT HI-LIFT USE - POLICY AND GUIDELINES

FACILITIES MANAGER:	DATE:
MAINTENANCE LEAD:	DATE:
TRANSPORTATION SUPERVISOR:	DATE:

Management

The Transportation Supervisor shall ensure qualified personnel maintain the hi-lift. The following records will be maintained and retained for a minimum of three (3) years:

- 1. Written records of the annual inspection and interval inspections.
- 2. Written record of all repairs accomplished on the aerial platform.
- 3. The names of all personnel (within the Transportation department) trained in the maintenance of the lift.
- 4. The names of all operators (within Facilities department) trained on the use of the aerial platform.

Operators

The facilities lead shall ensure that only qualified personnel operate the hi-lift.

Operators are responsible for operating the aerial platform within the provisions outlined in the operator's manual. They are likewise responsible for ensuring all personnel on the aerial platform comply with the provision outlined in the operator's manual.

Operators shall adhere to the following practices:

- 1. The aerial platform is operated on a surface within the limits specified by the manufacturer.
- 2. Any outriggers, stabilizers, extendable axles, or other stability-enhancing means are employed and utilized as required by the manufacturer.
- 3. All guard rails are installed and access gates or openings are closed per the manufacturer's instructions.
- 4. Any load and its distribution on the platform and any platform extensions employed are in accordance with the manufacturer's rated capacity for that specified configuration.
- 5. There is adequate clearance from overhead obstructions.
- 6. The minimum safe approach distances (MSAD's) to energized power lines and parts listed in the operator's manual are maintained.
- 7. All personnel on the platform wear fall-protection devices and other safety gear as required.

The Operator will ensure certain safe operating practices are followed. This includes but is not limited to the following:

- 1. All occupants will maintain firm, level footing on the floor of the platform. The use of mid-rails, top rails, and ladders, boxes, or any other means to enhance vertical reach shall not be used. The use of planks or other devices to accommodate further horizontal reach shall not be used.
- 2. Proper allowance will be made for other moving equipment.
- 3. Any problems or malfunctions that become evident during the operation are reported to the maintenance lead. Any problems or malfunctions that affect the safety of the operation shall be reported immediately to the transportation foreman and repaired prior to continued use.
- 4. There shall be no altering or disabling of interlocks or other safety devices.
- 5. Under all travel conditions (if applicable), speed is limited according to ground surface, congestion, visibility, slope, location of personnel and other factors which may cause collision or injury to personnel.
- 6. Ensure that means provided by the manufacturer to protect against usage by unauthorized personnel are actuated upon leaving the aerial work platform.
- 7. There will be no modification of the aerial platform without written approval of the manufacturer.

LOCKOUT/TAGOUT REQUIREMENTS

Purpose

The purpose of this policy is to establish a means of positive control to prevent the accidental starting or activating of machinery or systems while they are being repaired, cleaned, or serviced. This policy serves to:

- 1. Establish a safe and positive means of isolating machinery, equipment and systems from potentially hazardous energy sources via padlocks.
- 2. Provide a secondary control system (defined as tagout control) when it is impossible to positively lockout the machinery or equipment.
- 3. Prohibit an authorized employee, affected employee, or remote control system from starting machinery or equipment while being serviced.
- 4. Establish responsibilities for locking-out or tagging-out equipment to be serviced.
- 5. Ensure that only approved locks, standardized tags and fastening devices will be utilized in the Lockout/Tagout Process.
- 6. Establish the requirement that **ALL** energy control points that affect work in the danger zone are locked or tagged.
- 7. Establish the requirement that the lockout must provide complete energy isolation, without possible override.

Note: Push buttons, selector switches, interlocks, emergency shutoffs, software controls and other control-circuit type devices are not energy control points and cannot be used to fulfill this program.

Scope

The scope of this policy applies to the following equipment, personnel and working conditions.

- Any equipment owned or rented by the District that meets **ALL** of the following criteria:
 - a) Is **NOT** under the authority of the District Energy Control Center (ECC). (Work performed on equipment that is under the authority of ECC shall follow the *Clearance Procedures* found in the District Switching and Clearance Procedure Manual.), **AND**
 - b) Is under repair, cleaning, servicing, or maintenance, **AND**
 - c) Is connected to hazardous stored energy or has the potential to store hazardous energy, **AND**
 - d) The work requires a person to place any part of his/her body into an area where a danger zone exists.
- All District personnel required to perform equipment repair, servicing or cleaning.
- All District contracted personnel required to perform repair, servicing or cleaning on Districtowned equipment.
- All other employees exposed to areas where lockout/tagout is being performed.
- All District/contractor personnel that operate or use a machine subject to servicing under this Lockout Tagout Procedure (affected employee).
- Electrical hazardous energy is anything above fifty (50) VAC or fifty (50) VDC.

This Lockout/Tagout Procedure does not apply to:

- Generating equipment, transmission or distribution lines and equipment energized at over 600 volts and under the authority of ECC.
- Electric equipment for which electrical energy is the only energy source and it can be isolated and controlled by unplugging the equipment from the outlet and keeping the plug under exclusive control of the employee performing the servicing or maintenance.

THE LOCKOUT/TAGOUT PROCESS

The Lockout/Tagout Process includes the following requirements:

- Use qualified locks and qualified tags only.
- Qualified locks and/or lockout devices must be attached to the energy control point to keep the hazardous energy from being reintroduced to the equipment while all work is being conducted.
 Each lock shall be placed with a Do Not Operate tag that includes the authorized employee's name, date, and the associated Lockout/Tagout Procedure line number if a Lockout/Tagout Procedure is being used.
- All District employees and contractors must have individual locks and keys such that the individual is the only person who possesses the key. (The authorized employee's employer may possess a second key. See section *Non-routine Removal of a Lockout/Tagout Device*).
- Employees working as a group must each have his/her own lock and utilize either a lockbox or multiple-user locking device.
- Any person entering any danger zone, regardless of length of time, is considered an authorized employee and must meet all requirements to become an authorized employee, including applying his/her own lock and tag per the Lockout/Tagout Procedure.

Preparing Equipment for Lockout/Tagout and Installing the Locks and Tags

Utilize the following process to lockout and/or tagout the equipment to be repaired, serviced, or cleaned. This process shall be performed by the authorized employee(s) who will be working on the equipment. In the event that the maintenance requires a Lockout/Tagout Coordinator, the coordinator shall perform the following steps:

- 1. An authorized employee who will be working on the equipment to be maintained, or the Lockout/Tagout Coordinator, shall complete a Lockout/Tagout Procedure Form. If a procedure has previously been developed, use that procedure as a template to complete the form. Verify that nothing has changed and that the procedure includes all control points for each source of hazardous energy.
- 2. If a new procedure is required, utilize the following steps:
 - 1. Identify the area of work in the lockout/tagout zone.
 - 2. Identify the proper control point of each source of hazardous energy.
 - 3. Complete the Lockout/Tagout Procedure Form with each control point listed in the logical sequence required to isolate the equipment.
 - 4. Sign and date the form.
- 3. In the event that a Lockout/Tagout Coordinator is used, a second reviewer shall review, sign, and date the form. This second review shall be an authorized employee involved with the equipment maintenance. This second review shall be the Lockout/Tagout Coordinator if the form was originally completed by an authorized employee.

- 4. Obtain qualified locks, qualified tags, and locking and/or blocking devices as necessary.
- 5. Notify workers of intent to de-energize. Affected employees relevant to the equipment to be maintained must be notified by the authorized employee prior to the application of any lockout or tagout device.
- 6. Begin shutdown. De-energize and dissipate any residual energy (springs, hydraulic pressure, water pressure, steam, flywheels, gravity, etc.) by blocking, bleeding down or other appropriate means.
- 7. Following the Lockout/Tagout Procedure, apply lockout devices and tagout tags to each energy source in the sequence notated in the procedure. Once the lockout device or tag has been applied, the key shall be removed and remains exclusively in the authorized employee's possession. If the lockout/tagout includes using a lockout/tagout coordinator, his/her personal lock shall be placed on effective lockable equipment, then the coordinator's key shall be placed in the lockbox.
- 8. Tags shall be notated with name of the employee who placed the tag.
- 9. Tags shall be placed on the lock or placed at the tag location if locks cannot be used.
- 10. Initial and date the Lockout/Tagout Procedure for each lock or tag placed.
- 11. Where more than one authorized employee will be working on a machine or piece of equipment, each authorized employee must apply his/her own lock or tag to the energy-isolation device. The key for each lock must be in the possession of the employee who applied the lock. (Exception: Lock Box)
- 12. In the event that a lockbox is used, each authorized employee must apply his/her own lock to the lockbox. The key for the lock must be in the possession of the employee who applied the lock.
- 13. Confirm the equipment has been de-energized, grounded, and protected against possible reenergization. This may be accomplished by initiating a normal startup procedure, testing for the presence of AC or DC voltages, testing for the presence of hazardous pressures, or any other means suitable to confirm that the equipment has been de-energized and cannot be re-energized.
- 14. Wear the appropriate PPE.
- 15. Begin work.

Restoring the Equipment to Normal Operation When Service is Complete

- 1. Inspect the work area to ensure that all non-essential items, tools, etc. have been removed from the danger zone.
- 2. Check that all the guarding in safety controls have been properly replaced.
- 3. Notify affected employees and ensure that all personnel are in a safe location prior to reenergizing the equipment.
- 4. Remove locks, tags, blocking devices, and grounds in the order notated on the Lockout/Tagout Procedure.
- 5. Re-energize equipment/system according to start up procedures specific to each piece of equipment.
- 6. Confirm the system is operating properly and safely before returning control of the equipment back to any affected employees.
- 7. Check locks, tags and lockout devices for damage or cleaning needed. Replace as needed.

If an authorized employee who has applied locks/tags is not available to remove them, the Non-Routine Removal of Lockout/Tagout Device Procedure must be utilized. The removal of the lockout device has serious consequences and must not be taken lightly.

Temporarily Energizing a Machine/Equipment for Testing or Positioning

Follow line items 1 through 5 of the section *Restoring the Equipment to Normal Operation When Service is Complete* of this policy to temporarily energize a machine or equipment for testing or positioning purposes. Reapply the lockout or tagout devices when testing or positioning is complete.

Crew Lockout

When a group of workers or crew is assigned to service or repair a machine covered under the Lockout/Tagout Procedure, each authorized employee will affix a personal lock to the lockbox when they begin work and will only remove the device when they complete work on the machine or when they are planning on being absent.

Each authorized employee, including contractors, shall be allowed to verify individually that the hazardous energy has been isolated and/or de-energized.

ROLES AND RESPONSIBILTIES

The District is responsible for providing the tools and resources necessary to implement this policy and for ensuring that provisions in this policy are being followed.

Affected/Other Employees

Affected employees are responsible to:

- Provide assistance to authorized employee, as requested, for the proper shutdown and identification of isolation locations.
- Not attempt to start locked out or tagged out equipment/machines.
- Not attempt to remove or tamper with locks or tags for any reason.
- Not remove locks/tags or startup equipment/machines that could endanger the lives of those performing the work.

Authorized Employees

Authorized employee(s) are responsible to:

- Successfully complete necessary training on Lockout/Tagout Procedures.
- Understand the purpose and function of the Lockout/Tagout Policy.
- Understand and recognize hazardous energy sources, their potential, and methods and means necessary for their control.
- Become familiar with and utilize specific Lockout/Tagout Procedures written for specific equipment.
- Develop new Lockout/Tagout Procedures as needed.
- Conduct a job briefing with the Lockout/Tagout Coordinator before locking on to a lockbox.
- Apply locks and tags in accordance with the Lockout/Tagout Procedure before beginning work.
- Keep the lockout/tagout coordinator up to date with the work status during a Lockout/Tagout Process.
- Remove their personal lock(s) from a lockbox or the individual locked points when the work is completed or when they are planning to be absent.

• Ensure affected employees relevant to the equipment being maintained or serviced are notified of maintenance to be performed.

Lockout/Tagout Coordinator

See Generation Facility Lockout/Tagout Procedure section

Supervisor or Superintendent

Supervisor or Superintendent is responsible to:

- Train authorized employees as needed on Lockout/Tagout Procedures written for specific equipment to assure competent application of a Lockout/Tagout Procedure.
- Document training and provide training records to the Safety department.
- Provide retraining as detailed in the *Retraining of Authorized Employees* section.
- Review incidents where a lock or tag is not respected, Lockout/Tagout Procedure is not followed, or the Lockout/Tagout Policy is not followed.
- Ensure that only qualified locks and qualified tags are used.
- Act as the employer's representative for the non-routine removal of a lockout/tagout device.

Safety Department

The Safety Department is responsible to:

- Train authorized employees in the Lockout/Tagout Policy annually.
- Develop and periodically review and update the Lockout/Tagout Policy
- Develop and periodically review and update the training program.
- Retain employee/contractor training records.
- Conduct an annual Lockout/Tagout Procedure review. See *Annual Procedure Review* section of this document.

NON-ROUTINE REMOVAL OF A LOCKOUT/TAGOUT DEVICE

When the authorized employee who applied the lock and any associated tags is not available to remove them, the devices may be removed by the authorized employee's employer (supervisor /Superintendent) in accordance with the procedures described below.

1. The authorized employee's supervisor/superintendent must verify that the authorized employee who applied lock(s) and associated tag(s) is not on duty and that they are not within the hazardous energy zone.

All reasonable efforts will be made to contact the authorized employee(s) to discuss the planned removal of their lock(s) and determine if the authorized employee(s) have any safety concerns with the removal of their lock(s).

Removal of a lockout/tagout device has serious consequences and must not be taken lightly.

- 2. The authorized employee's supervisor/superintendent shall remove the locks/tags and inform the Lockout/Cagout coordinator and other authorized employees associated with the work of the lock/tag removal.
- 3. When the authorized employee(s) whose lock(s) were removed returns to work, their supervisor will notified them that their lock(s) and tag(s) were removed.

4. The employer (supervisor/superintendent) may keep a master key for the purpose of non-routine removal of a lock. All master keys must be retained in a locked drawer and controlled so that only those persons authorized and trained to use the master key in accordance with this policy can gain access.

SUBSTATION AND GENERATION FACILITIES LOCKOUT/TAGOUT (LOTO) PROCEDURES – LOW VOLTAGE CONDUCTORS (50V > 600V)

When the work is performed on low-voltage conductors that are part of the transmission, distribution, or generation systems in Substation/Generation facilities, one of the following methods shall be used for employee protection when contact is necessary:

- Energized low-voltage relay, control, metering or communication equipment may be worked using insulated gloves or insulated tools **OR**;
- De-energized low-voltage relay, control, metering or communication equipment may be worked on using insulated gloves or insulated tools **OR**;
- De-energized low-voltage relay, control, metering or communication equipment may be worked on when disconnected from their source with a visual open point, **OR**,
- De-energized low-voltage relay, control, metering or communication equipment may be worked on without low-voltage gloves or insulated tools only when the **LOTO** Process are being followed. Employees must use a lockout device, except where use of a lockout device is either impossible or impracticable. Taking additional time to use a lockout device does not constitute impossibility or impracticability.
- The tag must be:
 - 1. Secured with an individual padlock or a cable tie.
 - 2. The tag must be secured in a way that will withstand inadvertent or accidental detachment during the work. Tags must be located as close as possible to the energy isolating device and in a position immediately obvious to anyone tempting to operate energy isolating device.

Note: If it is impossible or impracticable to use a lockout device, employees must still apply a Do Not Operate Tag. In addition, a log of tagged-out equipment shall be maintained at the worksite and be readily available to the employees.

CONTRACTORS WORKING ON GENERATION FACILITIES

The following conditions apply outside contractors that perform servicing or maintenance that requires lockout/tagout:

- 1. As stated by WAC 296-803-100, contractors shall follow their own lockout/tagout policies and procedures. The District will provide the contractor a copy of the District's LOTO Policy and Procedure(s), but the contractor shall follow their own policies and retain responsibility for assuring that equipment is locked and tagged for safe maintenance.
- 2. The District (authorized employee, project manager, or Safety department) shall inform the contractor of the District Lockout/Tagout Policy and supply them with a copy. The District shall also inform the contractor of energy control procedures for any equipment under maintenance, develop the Lockout/Tagout Procedure (by LOTO coordinator), and assist the contractor in

locking out and/or tagging out equipment. All necessary safety information will be communicated to the contractor before work commences.

3. The District (authorized employee, project manager, or Safety department) shall obtain and review a copy of the contractor's lockout or tagout procedures. If the contractor's lockout tagout procedures include additional requirements above and beyond the District Policy/Procedures, the District shall ensure the contractor follows the additional restrictions of its energy control program.

CONSULTANTS WORKING ON GENERATION FACILITIES

Consultants, inspectors, regulatory inspectors, etc. may be required to be within the hazardous zone of equipment or machinery that has been locked out or tagged out to perform inspections or assess damage. Consultants shall follow the District's Lockout/Tagout Policy and Procedures and follow District requirements for qualifying as an authorized employee.

GENERATION FACILITY LOTO COORDINATOR

At District Generation facilities, work may require the use of both LOTO and Switching and Clearance Procedures and grounding. During these circumstances, a LOTO coordinator is required to coordinate the work with all parties involved with the maintenance, including but not limited to:

- All authorized employees involved with the maintenance
- All affected employees associated with the equipment under maintenance
- All other employees within the vicinity of the equipment under maintenance
- The District Energy Control Center if clearances are involved
- The plant superintendent
- The project manager
- The contractor

Refer to the *LOTO Coordinator Equipment List* maintained by the hydro superintendent to determine if a LOTO coordinator should be assigned. The LOTO coordinator will determine sources of hazardous stored energy and the LOTO procedure and grounding to be used (i.e. lockbox, group lock-out).

Responsibilities

The LOTO coordinator will be used when LOTO and Switching and Clearance Procedures are both required, when multiple crews or groups of workers are working together on the equipment or systems that require the use of lockout/tagout, or if a contractor is performing maintenance on District equipment. The LOTO coordinator will provide oversight to different crews working on the project. The LOTO coordinator is responsible to:

- Prepare and maintain the Lockout/Tagout Procedure.
 - Determine the sequence of the placement of locks and tags in complex isolation events.
- Be first on and last off with locks.
- May direct authorized employees to do specific switching tasks and place Do Not Operate Tags.
- Validate all isolation points. Validation is defined as either personally inspecting all isolation points or directing an authorized employee to verify an isolation point and report back with the status.

Conditions Requiring a LOTO Coordinator

• If the source of the equipment is 600 volts and above

- If a switching order is required
- If a contractor or non-generation staff are working on the equipment
- If the system is complex to isolate
- Use of a lock-box:

The lock-box is designed to be used when multiple authorized employees are required to work on complex systems. The LOTO coordinator shall lock and tag all sources of stored energy, rendering the system safe for the workers. Then the LOTO coordinator shall place their key in the lock-box allowing other authorized employees to lock onto the lock-box. This eliminates the need for each individual to lock on every piece of equipment with the potential of stored energy in the system. Although the lock-box is designed to be a stand-alone function, it can also be used in a daisy-chain fashion. If an authorized employee locked on to the original lockbox puts his/her key in the second lockbox, taking it to a remote location where work is being done, but still under the umbrella of the original LOTO, a second lockbox can then be established.

SHIFTS OR PERSONNEL CHANGES

When work involving lockout/tagout extends beyond a single shift, the authorized employee going off shift may keep his/her locks/tags in place during shift changes as long as they intend to return to continue the maintenance work.

At no time shall the machine being worked on be without the protection of a lockout device.

ANNUAL PROCEDURE REVIEW

A sample of prepared Lockout/Tagout Procedures will be reviewed **at least annually**. The procedure will be reviewed for adequacy and completeness by an authorized employee who does not regularly use the machine/equipment. If any deviations or inadequacies are identified, the authorized employee will take all necessary steps to update the procedure. The annual review will be performed by the Safety department. The review will include an interview of the authorized employee to determine if they understand the Lockout/Tagout Policy and procedures under review. The Safety department shall document the review and retain the review documentation per District document retention policies.

TRAINING

Authorized Employees

Snohomish County PUD shall develop and provide lockout/tagout training for District employees and District-hired consultants on the recognition of applicable hazardous energy sources, the types and magnitudes of the energy available in the workplace, the methods and means available for energy isolation and control, and removal of energy-control devices. Equipment-specific training will be accomplished by presenting applicable written Lockout/Tagout Procedures to authorized employees, verifying that they understand the requirements of the procedures, and observing correct performance of the Lockout/Tagout Procedures.

Supplemental training for District supervisors/superintendents shall include a section on the procedures for the non-routine removal of a lockout/tagout device, including when non-routine removal may be implemented, and proper storage practices for the master key.

Affected/Other Employees

- Affected employees working in areas where lockout/tagout may be used are required to have the same training as an authorized employee.
- Affected employees must be retrained if a significant regulation or lockout/tagout guideline changes have been made.
- Retraining can be delivered through awareness training.
- Other employees will be trained as needed if they are in the vicinity of a LOTO area.

Retraining of Authorized Employees

Retraining is required if:

- There are changes to this policy that merit retraining.
- There is a change in task assignment that involves use of different Lockout/Tagout Procedures for which the authorized employee has not been physically trained.
- There is a change in the machine, equipment or processes that presents new hazards.
- There is a change in the energy-control procedures.
- The supervisor or superintendent has reason to believe, or determines through a periodic inspection or observation, that an authorized employee is performing the energy-control procedures inadequately or has deviated from or lacks sufficient knowledge of established policies and procedures.
- District management has reason to believe retraining is necessary.

RECORD RETENTION

- All training records, including employee/contractor's names and training dates will be maintained in the Safety department.
- Training records will be maintained indefinitely.
- Perform and document periodic reviews to verify employees know and follow the energy control procedures per WAC requirements (296–803–70005).

DEFINITIONS

- Affected employee: An employee whose job requires him/her to operate or use a machine or equipment to which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in the area where such servicing or maintenance is being performed. An example: A machine operator who does not service or maintain the equipment he/she typically operates.
- Authorized employee: A person who locks out and/or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An employee may only become an authorized employee after he/she:
 - Successfully completes necessary training on Lockout /Tagout Procedures
 - Understands the purpose and function of the Lockout/Tagout Policy
 - Understands and recognizes hazardous energy sources, their potential, and methods and means necessary for their control

Note: Contractors shall follow their own LOTO policies, procedures, or programs to qualify their employees as an authorized employee.

• **Contractor:** A person or company that undertakes a contract to provide materials or labor to perform a service or do a job with the District.

- **Consultant:** A person or company retained by the District to perform professional services that may include equipment inspection. This term includes regulatory inspectors.
- **Crew:** A group of workers on the same project who are using the same LOTO procedures on the same set of energy-isolating devices.
- The District: Public Utility District No. 1 of Snohomish County
- **ECC:** Snohomish County PUD Energy Control Center. ECC is responsible for and authorized to operate the District electrical power system for the District.
- **Hazardous energy:** Electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gravity or other form of energy that could cause injury due to the unintended motion of energizing, starting-up, or release of such stored or residual energy in machinery, equipment, piping, pipelines are process systems.
- **Lockout:** The process of blocking the flow of hazardous energy from a power source to a piece of equipment and keeping it blocked out by placement of a lock.
- Lock box: A toolbox-style box of rugged construction capable of receiving a lock or hasp when the box is shut. When the lock or hasp is attached, a person cannot enter the box until the lock/hasp is removed.
- Lockout/Tagout Coordinator: A lead authorized employee responsible for coordinating group lockout/tagout for a crew of authorized employees, multiple crews, or complex situations.
- Lockout/Tagout Policy: This document is the District's Lockout/Tagout Policy.
- Lockout/Tagout Procedure: The completed form identifying all points that must be locked or tagged per the Lockout/Tagout Policy.
- **Lockout device**: A device such as a lock, chain, block, pin, or bolt that positively holds an energy isolating device in its safe position to prevent energizing machinery or equipment.
- **Other employee:** Employees who are neither authorized employees nor affected employees, but are in the vicinity of areas where lockout/tagout is being performed, but are not within the hazard zone.
- **Qualified lock:** A lock designed for the purpose of being used for lockout procedures. The authorized employee using a qualified lock must be the only person that possess the key. Each lock shall be placed with a Do Not Operate tag that includes the authorized employee's name, date, and the associated Lockout/Tagout Procedure line number, if necessary.
- **Qualified tag:** A District Do Not Operate tag is the only tag that is qualified to be used for tagout purposes.
- **Tagout:** The process of securing/deactivating, stopping or blocking the flow of energy and placing a qualified tag on the energy-isolating devices to act as a warning not to restore energy.

GENERAL RULES FOR TRANSMISSION/DISTRIBUTION/SUBSTATION

All rules in WAC 296-45 shall apply where appropriate.

The live line barehanded technique is prohibited.

FOR CLEARANCE REQUIREMENTS FOR WORKING ON DE-ENERGIZED TRANSMISSION AND DISTRIBUTION LINES AND/OR EQUIPMENT SEE THE DISTRICT'S *SWITCHING AND CLEARANCE PROCEDURES MANUAL*.

JOB BRIEFING

Lead worker must conduct a job briefing with all the employees involved before they start each job. The briefing must cover at least the following: Hazards associated with the job, work procedures involved, special precautions, energy source control, and personal protective equipment requirements 296-45-135 (3).

If the work during the day or shift is repetitive and similar, at least one (1) job briefing must be conducted before the start of the job of each workday or shift. Additional briefings must be held if significant changes, which might affect the safety of the employees, occur during the course of the work.

A brief discussion is satisfactory if the work involved is routine and if the employee(s), by virtue of training and experience, can reasonably be expected to recognize and avoid the hazards involved. A more extensive discussion must be conducted if the work is complicated or particularly hazardous or if the employee cannot be expected to recognize and avoid the hazards involved in the job.

An employee working alone need not conduct a job briefing, but must ensure that the tasks to be performed are planned as if a briefing were required.

TRAINING - WAC 296-45-065

Employees shall be trained and proficient in the safety-related work practices, safety procedures, and other safety requirements in this section that pertains to their respective job assignments. Employees shall also be trained in and proficient with any other safety practices, including applicable emergency procedures (such as pole top, aerial, manhole, vault and tree rescue), that are not specifically addressed by this section but that are related to their work and are necessary for their safety.

Qualified electrical employees shall also be trained and competent in:

- 1. Skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment
- 2. Skills and techniques necessary to determine the nominal voltage of exposed live parts
- 3. Minimum approach distances specified in this section corresponding to the voltages that the qualified electrical employee will be exposed to and the skills and techniques necessary to maintain these distances

- 4. The proper use of precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment
- 5. The recognition of electrical hazards that the employee may be exposed to and the skills and techniques necessary to control or avoid these hazards

Note: For the purpose of this section, a person must have this training in order to be considered a qualified electrical employee.

The District, through regular supervision and inspections conducted on at least an annual basis, shall ensure that each employee is complying with safety-related work practices required by this section.

An employee shall receive additional training (or retraining) under any of the following conditions:

- 1. If the supervision and annual inspections indicate the employee is not complying with the safetyrelated work practices required by this section; or
- 2. If new technology, new types of equipment, or changes in procedures necessitate the use of safetyrelated work practices that are different from those that the employee would normally use; or
- 3. If the employee must employ safety-related work practices that are not normally used during their regular job duties.

Note: DOSH (Division of Occupational Safety and Health) would consider tasks performed less than once per year to necessitate retraining before the performance of the work practices involved.

The training required shall be in the classroom or on-the-job.

The training shall establish employee proficiency in the work practices required by this section and shall introduce the procedures necessary for compliance with this section.

The District shall certify that each employee has received the training required by this section. This certification shall be made when the employee demonstrates proficiency in the work practices involved and shall be maintained for the duration of the employee's employment. Employment records that indicate an employee has received the required training are an acceptable means of meeting this requirement.

WORKING ON OR NEAR EXPOSED ENERGIZED PARTS - WAC 296-45-325

Only qualified electrical employees may work on or with exposed energized lines or parts of equipment. Only qualified electrical employees may work in areas containing unguarded, uninsulated energized lines or parts of equipment operating at fifty (50) volts or more. Electric lines and equipment shall be considered and treated as energized unless properly cleared and grounded, if needed. See *Switching and Clearance Procedures Manual* requirements.

At least two (2) qualified employees shall be present while the following types of work are being performed:

- 1. Installation, removal, or repair of lines that are energized at more than 600 volts;
- 2. Installation, removal, or repair of de-energized lines if an employee is exposed to contact with other parts energized at more than 600 volts;
- 3. Installation, removal, or repair of equipment, such as transformers, capacitors, and regulators, if an employee is exposed to contact with parts energized at more than 600 volts;
- 4. Work involving the use of mechanical equipment, other than insulated aerial lifts, near parts energized at more than 600 volts; and
- 5. Other work that exposes an employee to electrical hazards greater than or equal to those exposed by the operations that are specifically listed above.

One qualified electrical employee shall serve principally as a standby employee who shall be located so that he/she may physically reach the other employee in the event of an accident, either with his/her hand or a hot stick. The standby shall be positioned to observe the other employee, his/her bodily movements, and verbally warn of any impending dangers. In no case when working in pairs shall employees work simultaneously on energized wires or parts of different phases or polarity.

When installing or removing a hot line clamp connection on a multiphase system, it is permissible for the second qualified electrical employee to stand by at the lower controls of the aerial lift provided the connection or disconnection does not interrupt or pick up load. The line clamp and connecting jumper must be constructed so it cannot make contact with any other energized parts. The work must not be performed above lines or apparatus energized at more than 600V.

In cases of necessity, the standby employee may temporarily assist the other employee provided that they both work on wires or parts of the same phase or polarity. Both employees shall position themselves so that the presence of the second person does not increase the hazard.

The provisions of the above subsection do not apply in the following circumstances:

- 1. When re-fusing circuits or equipment with a live line tool
- 2. When operating switches by means of an operating handle or switch sticks
- 3. When installing or removing a live line clamp connection with an approved live line tool on single phase line or apparatus, providing that the connection or disconnection does not interrupt or pick up load **AND** that the employee is positioned so that he/she is neither within reach of nor otherwise exposed to contact with energized parts. This may require more than the minimum approach distance(s).

The live line clamp and connecting jumper must be constructed so that it cannot make contact with any other energized parts.

On a multiphase feed this applies only when one single phase line or apparatus is present on the load side.

4. When installing or removing by live line tool simple load metering devices provided that the connection does not interrupt or pick up load **AND** that the employee is positioned so that he/she is

neither within reach of nor otherwise exposed to contact with energized parts. This may require more than the minimum approach distance(s).

5. Emergency repairs to the extent necessary to safeguard the general public.

MINIMUM APPROACH DISTANCES

No employee shall approach or take any conductive object closer to exposed energized parts than set forth in Table 2.

- 1. The employee is insulated from the energized part (insulating gloves or insulating gloves and sleeves worn) and be so positioned that a slip or shock will not bring any part of the employee's body into contact with exposed, uninsulated parts energized at a potential difference from the employee; or
- 2. The energized part is insulated from the employee and the employee is so positioned that a slip or shock will not bring any part of the employee's body into contact with exposed, uninsulated parts energized at a potential difference from the employee from any other conductive object at a potential difference.
- 3. Mack's/hot jumpers Minimum approach distances must be maintained unless the Mack/hot jumper is tested and labeled with a current date.

Cables, which are properly insulated for the voltages to which they are energized, shall be considered as an effective barrier to protect the employee and Table 2 need not apply.

Rubber gloves can only be used on 5,000 volts or less between phases.

Nothing contained herein shall prevent the use of approved live line tools on any voltage.

The following methods must be used when making or disconnecting connections:

- 1. When connecting de-energized equipment or lines to an energized circuit by means of a conducting wire or device, an employee shall first attach the wire to the de-energized part
- 2. When disconnecting equipment or lines from an energized circuit by means of a conducting wire or device, an employee shall remove the source end first and loose conductors shall be kept away from exposed energized parts.

If there is a possibility of voltage back-feed from sources of co-generation or from the secondary system (i.e., back-feed from more than one energized phase feeding a common load), the lines or equipment must be worked on as energized or all phases cleared, tested and grounded.

	Distance to Employee							
Voltage in Kilovolts Phase to Phase*			Phase to Ground			Phase to Phase		
			(m)	(ft-1/10)	(ft-in)	(m)	(ft-1/10)	(ft-in)
Table 2-A For KV and Less	r Vo (1,2,	ltages of 72.5 3,4)						
0	to	0.050	r	not specified		1	not specified	1
0.051	to	0.300	a	void contact	ţ	8	woid contac	t
0.301	to	0.750	0.33	1.09	(1'-2")	0.33	1.09	(1'-2")
0.751	to	5	0.63	2.07	(2'-1")	0.63	2.07	(2'-1")
5.1	to	15.0	0.65	2.14	(2'-2")	0.68	2.24	(2'-3")
15.1	to	36	0.77	2.53	(2'-7")	0.89	2.92	(3'-0")
36.1	to	46.0	0.84	2.76	(2'- 10")	0.98	3.22	(3'-3")
46.1	to	72.5	1.00**	3.29**	(3'-3")	1.20	3.94	(4'-0")
1Employers may use the minimum approach distances in this table provided the worksite is at an elevation of 900 meters (3 000 feet) or less. If employees will be working at elevations greater than								

 Table 2

 AC Live Work Minimum Approach Distance

1Employers may use the minimum approach distances in this table provided the worksite is at an elevation of 900 meters (3,000 feet) or less. If employees will be working at elevations greater than 900 meters (3,000 feet) above mean sea level, the employer shall determine minimum approach distances by multiplying the distances in this table by the correction factor in Table 3 below. A corresponding to the altitude of the work.

2For single-phase systems, use voltage-to-ground.

3For single-phase lines off three phase systems, use the phase-to-phase voltage of the system.

4The 46.1 to 72.5 kV phase-to-ground 3-3 distance contains a 1-3 electrical component and a 2-0 inadvertent movement component.

Table 2-B For Voltages of 72.6KV (1,2,3)						
72.6 to 121	1.13**	3.71**	(3'-9")	1.42	4.66	(4'-8")
121.1 to 145.0	1.30	4.27	(4'-4")	1.64	5.38	(5'-5")
145.1 to 169.0	1.46	4.79	(4'- 10")	1.94	6.36	(6'-5")
169.1 to 242.0	2.01	6.59	(6'-8")	3.08	10.10	(10'- 2")
242.1 to 362.0	3.41	11.19	(11'- 3")	5.52	18.11	(18'- 2")
362.1 to 420.0	4.25	13.94	(14'- 0")	6.81	22.34	(22'- 5")

Distance to Employee						
Voltage in Kilovolts Phase to Phase*	Phase to Ground		Phase to Phase		se	
	(m)	(ft-1/10)	(ft-in)	(m)	(ft-1/10)	(ft-in)
420.1 to 550.0	5.07	16.63	(16'- 8")	8.24	27.03	(27'- 1")
550.1 to 800.0	6.88	22.57	(22'- 7")	11.38	37.34	(37'- 5")

1Employers may use the minimum approach distances in this table provided the worksite is at an elevation of 900 meters (3,000 feet) or less. If employees will be working at elevations greater than 900 meters (3,000 feet) above mean sea level, the employer shall determine minimum approach distances by multiplying the distances in this table by the correction factor in Table 3 below. A corresponding to the altitude of the work.

2Employers may use the phase-to-phase minimum approach distances in this table provided that no insulated tool spans the gap and no large conductive object is in the gap.

3The 72.6 to 121 kV phase-to-ground 3-2 distance contains a 2-2 electrical component and a 1-0 inadvertent movement component.

Note: The clear live-line tool distance shall equal or exceed the values for the indicated voltage ranges.

Table 3 Altitude Correction Factors				
Altitude above sea level (m)				
	A			
0 to 900	1.00			
901 to 1,200	1.02			
1,201 to 1,500	1.05			
1,501 to 1,800	1.08			
1,801 to 2,100	1.11			
2,101 to 2,400	1.14			
2,401 to 2,700	1.17			
2,701 to 3,000	1.20			
3,001 to 3,600	1.25			
3,601 to 4,200	1.30			
4,201 to 4,800	1.35			
4,801 to 5,400	1.39			
5,401 to 6,000	1.44			

Notes:

- WAC 296-45-475 (5) (a) and 296-45-48525 (1) contain requirements for the guarding and isolation of live parts. Parts of electric circuits that meet these two provisions are not considered as exposed unless a guard is removed or an employee enters the space intended to provide isolation from the live parts.
- When an employee is required to work on or within reach of any unprotected conductors that are or may become energized at more than 50 volts and less than 600 volts between phases, they shall take the following precautions:
 - They shall wear approved insulating gloves or insulating gloves and sleeves during the time they're working on such conductor; or
 - They shall cover, with approved devices, any adjacent unprotected conductor that could be touched by any part of their body, and use insulated tools.
 - Cables that are probably insulated for the voltages to which they are energized, shall be considered as an effective barrier to protect the employees and Table 2 need not apply.

TOOLS AND PROTECTIVE EQUIPMENT

Protective equipment shall not be used at voltages in excess of that for which the manufacturer has supplied data to the District demonstrating that it is fit for such voltage.

No protective equipment shall be modified, altered, or used for purposes other than those for which it is designed unless and until the manufacturer has, in writing, agreed to or suggested that there be such modification, alteration, or use.

Rubber Protective Equipment

High-voltage rubber gloves shall be tested, marked and pass a minimum dielectric test.

Each rubber glove, before it is used, shall be inspected for defects and an approved air test performed. If, upon inspection, rubber gloves are defective or appear to be defective, they shall not be used.

Rubber gloves and protective equipment shall not be used unless they have been dielectrically tested within six (6) months and bear markings or identification of the date of the dielectric test.

Approved leather protectors shall be worn at all times over rubber gloves. Inner liners may be worn if desired. Rubber glove protectors shall be used only for the purpose which they are intended.

Exception: Protective gloves need not be used with class O gloves, under limited use conditions, where small equipment and parts manipulation necessitate unusually high finger dexterity. Extra care is needed in the visual examination of the glove and in avoidance of handling sharp objects.

Approved rubber gloves and a carrying bag shall be assigned to each employee who works with, or is exposed to, energized parts. The gloves shall be stored in the carrying bag when not in use.

Gloves shall be stored on vehicles in a box or compartment for rubber protective equipment. No equipment shall be stored with the rubber protective equipment that could cause damage. A separate container or compartment shall be provided for rubber blankets.

Rubber protective equipment shall not be vulcanized or patched.
Line hose shall not be doubled on itself at any time. All blankets must be wiped clean and rolled, not folded, before being placed in the container or box for storage.

Protective line equipment of material other than rubber shall be kept clean and visually inspected before each use and dielectrically tested once a year or any time there is a concern regarding the condition of the equipment.

Insulated Tools

Only insulated tools having manufacturer's certification of withstanding the minimum tests in accordance with WAC 296-45-305 shall be used.

All live line tools shall be visually inspected each day before use. All live line tools shall be wiped clean before being used. If, after wiping, any defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the tool is found, it must be removed from service and examined and tested before returning it to service. All live line tools shall be dielectrically tested at least once a year. This includes protective plastic covers.

Defective live line tools shall not be used and shall be marked as defective and turned in for repair or replacement. If live line tools are repaired, they must be tested before returning it to service. Live line tools and ropes shall be stored, maintained, and used in such a manner as to prevent damage. Live line tools and ropes shall not be used for purposes other than line work.

Personal Flotation Devices

Whenever an employee may be pulled or pushed or may fall into water where the danger of drowning exists, the employee shall be provided with and shall use U.S. Coast Guard-approved personal flotation devices.

Each personal flotation device shall be maintained in safe condition and inspected frequently enough to ensure that it does not have rot, mildew, water saturation, or any other condition that could render the device unsuitable for use.

An employee may cross streams or other bodies of water only if a safe means of passage, such as a bridge, is provided.

Wearing Apparel

Goggles, rubber gloves, respirators, and other such personal protective devices shall not be interchanged among employees unless they have been sanitized.

Workers shall wear clothing appropriate to the season and the kind of work being performed: Provided, that the FR shirts or jumpers with full-length sleeves rolled down and protective hard hats and protective eye wear shall be worn when working on or near live parts or while climbing poles.

When working on or near energized parts, employees shall not wear loose dangling watch chains, key chains, or unnecessary metal of any type, and should not wear coats with metal zippers.

The District shall train each employee who is exposed to the hazards of flames or electric arcs in the hazards involved.

The District shall ensure that each employee who is exposed to the hazards of flames or electric arcs does not wear clothing that, when exposed to flames or electric arcs, could increase the extent of injury that would be sustained by the employee.

The District supplies flame-retardant clothing to those individuals whose job exposes them to the hazards of shock and arc flash and arc blast.

Note: Clothing made from the following types of fabrics, either alone or in blends, is prohibited by this subsection, unless the District can demonstrate that the fabric has been treated to withstand the conditions that may be encountered or that the clothing is worn in such a manner as to eliminate the hazard involved: Acetate, nylon, polyester and rayon.

Protection from Flames and Electric Arcs

- (a) The District shall assess the workplace to identify employees exposed to hazards from flames or electric arcs.
- (b) For each employee exposed to hazards from electric arcs, the District shall make a reasonable estimate of the incident heat energy to which the employee would be exposed.
- (c) The employer shall ensure that each employee who is exposed to hazards from flames or electric arcs does not wear clothing that could melt onto his/her skin or that could ignite and continue to burn when exposed to flames or the heat energy estimated under (b) of this subsection.
- (d) The employer shall ensure that the outer layer of clothing worn by an employee, except for clothing not required to be arc rated under (e)(i) through (v) of this subsection, is flame resistant under any of the following conditions:
 - i. The employee is exposed to contact with energized circuit parts operating at more than 600 volts;
 - ii. An electric arc could ignite flammable material in the work area that, in turn, could ignite the employee's clothing;
 - iii. The incident heat energy estimated under (b) of this subsection exceeds 2.0 cal/cm².
- (e) The District shall ensure that each employee exposed to hazards from electric arcs wears protective clothing and other protective equipment with an arc rating greater than or equal to the heat energy estimated whenever that estimate exceeds 2.0 cal/cm². This protective equipment shall cover the employee's entire body, except as follows:
 - i. Arc-rated protection is not necessary for the employee's hands when the employee is wearing rubber insulating gloves with protectors or, if the estimated incident energy is no

more than 14 cal/cm², heavy-duty leather work gloves with a weight of at least 407 gm/m² (12 oz./yd²);

- ii. Arc-rated protection is not necessary for the employee's feet when the employee is wearing heavy-duty work shoes or boots;
- Arc-rated protection is not necessary for the employee's head when the employee is wearing head protection meeting the estimated incident energy is less than 9 cal/cm² for exposures involving single-phase arcs in open air or 5 cal/cm² for other exposures;
- iv. The protection for the employee's head may consist of head protection and a face shield with a minimum arc rating of 8 cal/cm² if the estimated incident-energy exposure is less than 13 cal/cm² for exposures involving single-phase arcs in open air or 9 cal/cm² for other exposures; and
- v. For exposures involving single-phase arcs in open air, the arc rating for the employee's head and face protection may be 4 cal/cm² less than the estimated incident energy.

Additional Requirements for Working On/Near Energized Overhead Lines

Except during emergency restoration procedures, work shall be discontinued when adverse weather conditions would make the work hazardous in spite of the work practices required. Thunderstorms in the immediate vicinity, high winds, snow storms, and ice storms are examples of adverse weather conditions that are presumed to make this work too hazardous to perform, except under emergency conditions.

While on patrol at night and operating a motor vehicle on public highways, there shall be two (2) employees, at least one (1) of whom shall be a journey-level line worker or otherwise a competent or qualified electrical employee. If repair to line or equipment is found to be of such nature as to require two (2) line workers, work shall not proceed until additional help has been obtained provided that in cases of emergency where delay would increase the danger to life, limb, or substantial property, one employee may clear the hazard without assistance. When working at night, spotlights or portable lights for emergency lighting shall be provided and used, as is necessary, to perform work safely.

Current Transformer Secondarys: The secondary of a current transformer may not be opened while the transformer is energized. If the primary of the current transformer cannot be de-energized before work is performed on an instrument, a relay, or other section of a current transformer secondary circuit, the circuit shall be bridged so that the current transformer secondary will not open.

Capacitors: After a capacitor has been disconnected from its source of supply, workers shall wait five (5) minutes before short-circuiting and grounding them, unless the capacitor is equipped with an adequate grounding and/or short-circuiting device.

Employees shall take care not to contact the terminals, jumpers, or line wires connected directly to capacitors until they have been properly short-circuited and/or grounded. After removal from service, short circuits shall remain on capacitors in storage until returned to service.

Fuse handling: When fuses must be installed or removed with one or both terminals energized at more than 300 volts or with exposed parts energized at more than 50 volts, the employee shall use tools or gloves rated for the voltage. When expulsion-type fuses are installed with one or both terminals energized at more than 300 volts, the employee shall wear eye protection, use a tool rated for the voltage, and be clear of the exhaust path of the fuse barrel.

Non-current carrying metal parts of equipment or devices, such as transformer cases and circuit breaker housings, shall be treated as energized at the highest voltage to which they are exposed, unless the employee inspects the location and determines that these parts are grounded before work is performed.

Devices used to open circuits under load conditions shall be designed to interrupt the current involved.

When employees are working overhead, employees shall not dig nor do any other work that exposes them to danger due to inattention of the work being performed overhead.

While work is being performed overhead, tools and materials shall be placed in proper receptacles when not being used. Tools and materials shall not be thrown to or from the employees on the pole or other elevated position(s), but shall be raised and lowered by means of a hand line and/or tool bag. Tools and loose materials shall not be left on the poles, cross arms, ladders or other elevated structures or positions.

Precautions shall be taken to determine that the span and the supports are of a strength so as to safely bear the weight of the employee(s) and the equipment used thereon.

Before an employee climbs a pole, it shall be inspected or tested to determine that such pole is safe, both above and below the ground level. If the pole is found to be unsafe for climbing, it must be guyed or braced or otherwise supported in such a manner as to allow the employees to safely perform their work.

Before moving conductors, there shall be a thorough inspection for strength and good condition of the adjacent supporting poles, structures and conductor-supporting hardware. Approved safeguards shall be installed on such adjacent poles or structures as may be necessary to prevent unexpected or uncontrolled movement of these adjacent poles, structures or conductors supporting equipment or conductors.

Wood poles should be inspected by a qualified electrical employee for the following items to be considered when determining the condition:

- 1. Buckling at the ground line and for an unusual angle with respect to the ground. Buckling and odd angles may indicate that the pole has rotted or is broken;
- 2. Horizontal cracks perpendicular to the grain of the wood may weaken the pole. Vertical ones, although not considered to be a sign of a defective pole, can pose a hazard to the climber, and the employee should keep his/her gaffs away from them while climbing.

Hollow spots and woodpecker holes can reduce the strength of a wood pole.

Rotting and decay are cutout hazards and possible indications of the age and internal condition of the pole.

One large knot or several smaller ones at the same height on the pole may be evidence of a weak point on the pole.

Evidence of the existence of a former ground line substantially above the existing ground level may be an indication that the pole is no longer buried to a sufficient extent.

Soft, wet, or loose soil may not support any changes or stress on the pole.

Burning from transformer failures or conductor faults could damage the pole so that it cannot withstand mechanical stress changes.

TESTING OF WOOD POLES

The following tests are recognized as acceptable methods of testing wood poles:

Rap the pole sharply with a hammer weighing about three (3) pounds, starting near the ground line and continuing upwards circumferentially around the pole to a height of approximately six (6) feet. The hammer will produce a clear sound and rebound sharply when striking sound wood. Decay pockets will be indicated by a dull sound or a less pronounced hammer rebound. Also, prod the pole as near the ground line as possible using a pole prod or a screwdriver with a blade at least five (5) inches long. If substantial decay is encountered the pole should be considered unsafe.

Apply a horizontal force to the pole and attempt to rock it back and forth in a direction perpendicular to the line. Caution must be exercised to avoid causing power lines to swing together. The force may be applied either by pushing with a pike pole or pulling with a rope. If the pole cracks during the test, it shall be considered unsafe.

When poles are set, moved, or removed near exposed conductors the pole may not contact the conductors. No employee shall handle a pole without wearing rubber gloves or using an insulated device to prevent contact with any unprotected part of the employee's body.

When setting, moving or removing poles using cranes, derricks, gin poles, or similar equipment near energized lines or equipment, minimum clearances shall be maintained, as provided by Table 2 except when approved barriers or other line-protecting devices have been installed. See *Aerial Lift and Mechanical Equipment*, Section Q, for additional requirements.

Pole holes shall be attended by an employee or physically guarded to protect against someone falling into the hole.

MATERIALS HANDLING AND STORAGE - WAC 296-45-315

This section details material storage near energized lines or equipment. In areas not restricted to qualified electrical persons only, materials or equipment may not be stored closer to energized lines or exposed energized parts of equipment than the following distances plus an amount providing for

maximum sag and side swing of all conductors and providing for the height and movement of material handling equipment:

For lines and equipment energized at 50 kV or less, the distance is ten (10) feet.

For lines and equipment energized at more than 50 kV, the distance is ten (10) feet plus four (4) inches for every 10 kV over 50 kV, (115kV the distance is twelve (12) feet two (2) inches).

In areas restricted to qualified electrical employees, material may not be stored within the working space about energized lines or equipment.

Prior to unloading steel poles, cross arms and similar materials, the load shall be thoroughly examined to determine if the load has shifted, binders or stakes have broken or the load is otherwise hazardous to employees. The hoist rope shall not be wrapped around the load. This provision shall not apply to electric construction crews when setting or removing poles.

POLE HANDLING

During pole hauling operations, all loads shall be secured to prevent displacement, and a red flag shall be displayed at the trailing end of the longest pole. Use of the oversize signs on the pole trailers and the front of the truck must be used if the load and truck size exceed seventy-five (75) feet overall in length, or if the rear overhang exceeds fifteen (15) feet from the center of the rear axle, or the vehicle exceeds eight (8) feet six (6) inches wide, or the height of the load exceeds fourteen (14) feet.

While loading and unloading materials, roadways shall not be blocked unless approved traffic control is used.

When hauling poles during darkness, illuminated warning devices shall be attached to the trailing end of the longest pole in accordance with the state of Washington motor vehicle code.

Tag lines. When necessary to control loads a tag line or other approved device shall be used.

Oil-filled equipment. During construction or repair of oil-filled equipment, the oil may be stored in temporary containers other than those required by WAC 296-155-270, such as pillow tanks.

All tools and materials shall be stored in a safe and orderly manner in yards for equipment and other areas.

GUIDELINES FOR WORK ON AND SETTING STEEL/CONCRETE POLES IN ENERGIZED DISTRIBUTION LINES

Structures of steel or concrete can be appropriate for certain applications. Working on or around steel/concrete poles when there are energized conductors attached to or near the structure requires special procedures to ensure work can be safely accomplished. The intent of these guidelines is to provide proper safety considerations concerning the use of highly conductive structures in the future. The circuits attached to these structures should be designed to accommodate de-energizing without service interruption.

The guidelines would only apply if the foreman and crew can determine and agree upon a method to perform the task safely. In all cases, the foreman has the responsibility to stop the job if it cannot continue or be accomplished safely. The first approach to erect steel/concrete poles or work on the conductors should be to de-energize the circuit at the specific location where the task will be performed.

Work on steel/concrete poles with steel, wood or fiberglass distribution arms may be performed when the foreman and lineman on the crew performing the task all agree it can be done safely. All safe working and Minimum Approach Distances (MAD) shall be maintained. Approved and tested protective barriers and cover shall be used to maintain all safe working and MAD distances. All procedures, tools, equipment and PPE shall be discussed and recorded on the job briefing forms and they shall be utilized while performing the task.

The following are intended to be required minimum guidelines.

Training

All District employees involved with the erection of steel/concrete poles must be formally trained to safely perform this task. The training should include the hands on opportunity to erect a similar structure in a de-energized training situation before erecting a structure in an energized circuit. The training should include a review of all criteria from this recommendation that are accepted as guidelines for erecting steel/concrete poles in energized circuits and maintaining the circuits attached to these structures. All crew members shall be trained prior to the task. The task shall not be used as a training exercise.

Tools

Special tools are available to accommodate the task of sectionalizing to isolate areas of lines. The District is encouraged to provide these special tools.

Proper covers for the conductors and for the steel/concrete pole must be provided.

Tested fiberglass tools for handling and canting the pole must be provided. The handling of steel/concrete poles being erected and in the proximity of energized conductor should be accomplished by use of insulated tools or clean and dry nylon rope.

Electrical-rated, high-voltage, rubber boots (hot boots) must be provided to those line workers performing the work. All line workers performing the work must wear rubber gloves. However, handling poles within ten (10) feet of an energized conductor should not be done by direct contact with rubber gloves. High-voltage rubber gloves and dielectric boots are to be worn only to provide the worker protection in the case of inadvertent contact with the pole.

Nylon straps (chokers) must be used to rig poles to hoisting equipment. It is advisable to locate the choker where a bolt will prevent it from sliding up during the lift.

Equipment

The lifting capacity of the boom must be rated at 125% of the weight of the pick. Lifting capacity is to be determined by the provided manufacturer's rating.

An aerial manlift (bucket truck) with one or more fiberglass sections is required to do all work in the primary area of an energized steel/concrete pole. While the primary conductors are energized, no one climbing a steel/concrete pole shall perform any primary work.

Crew Size

The minimum crew size to set steel/concrete poles in energized circuits will be an A crew. An A crew typically consists of one (1) foreman, two (2) journeyman lineman and one (1) equipment operator or other qualified line person; provided these minimum crew size requirements shall not apply to outside contractors. Additional help will be provided at the request of the foreman.

Clearance

Adequately covered conductors must be positioned or repositioned to allow at least two (2) feet of clearance from the adequately covered steel/concrete pole during the entire erection process.

Most direct buried poles would need to be covered a minimum of eighteen (18) feet from the top for setting. The cover should extend a minimum of one (1) foot above the top of the pole.

At all times during the setting of the pole, the energized phase conductor should be covered a minimum of seven (7) feet in any direction from the pole being erected.

If the pole is not covered, a minimum distance of seven (7) feet must be maintained from adequately covered conductors. (i.e. setting a pole alongside an energized line.)

Conductors may be worked energized while attached to insulators on fiberglass/steel/wood arms provided the foreman and the linemen agree that work can be done safely while maintaining all safe working and MAD distances with the use of all approved and tested barriers and protective devices as necessary. (Pole top pins are not to be used on steel/concrete poles.)

Structure Design

The maximum length for any distribution pole or section of transmission structure to be erected in an energized circuit is fifty (50) feet. If structures of larger than fifty (50) feet are required, the size of the sections should be specified and purchased with sections appropriately sized to best accommodate safe installation.

In some cases, particularly for the top sections of transmission towers, a lifting eye located on the top of the structure or section would be helpful to rig for erection.

Structures shall be designed to provide a minimum of fifteen (15) inches between the conductor and the steel/concrete pole, and fiberglass distribution cross arms shall be required, whenever possible.

Hardware

New steel/concrete poles must meet all of the following hardware specifications to perform any work on the attached energized circuit. In the event structures cannot be designed to meet these specifications, the circuit should be designed with parallel sources to minimize outages.

Distribution: Nonmetallic arms and braces or brackets are to be used on all installations, when possible.

Post or pin insulators for distribution voltage must have the conductor attached using clamp-type devices.

Conductor dead-end attachments must utilize polymer insulators.

Installing and Removing Overhead Lines

The following provisions apply to the installation and removal of overhead conductors or cables.

The employee shall use the tension-stringing method, barriers, or other equivalent measures to minimize the possibility that conductors and cables being installed or removed will contact energized power lines or equipment.

When conductors are being strung in or removed, they shall be kept under positive control to prevent accidental contact with energized circuit.

The protective measures required by WAC 296-45-375 (10)(c) for mechanical equipment, shall also be provided for conductors, cables, and pulling and tensioning equipment when the conductor or cable is being installed or removed close enough to energized conductors that any failure could energize the pulling or tensioning equipment or the wire or cable being installed or removed:

- Failure of pulling or tensioning equipment;
- Failure of the wire or cable being pulled; or
- Failure of the previously installed lines or equipment
- 1. If the conductors being installed or removed cross over energized conductors in excess of 600 volts and if the design of the circuit-interrupting devices protecting the lines permits, the automatic-reclosing feature of these devices shall be made inoperative. In addition, the line being strung must be grounded on either side of the cross over or considered and worked as energized.
- 2. Guard poles, towers, or other structures installed for the purpose of protecting employees, lines, conductors or equipment during the course of construction shall be installed at the same clearance requirements as for permanent construction and with the strength and safety factors as required to safely support the loads that may normally be imposed on them during their use

Before lines are installed parallel to existing energized lines, the employee shall make a determination of the approximate voltage to be induced in the new lines, or work shall proceed on the assumption that the induced voltage is hazardous. Unless the employee can demonstrate that the lines being installed are not subject to the induction of a hazardous voltage or unless the lines are treated as energized, the following requirements also apply:

1. Each bare conductor shall be grounded in increments so that no point along the conductor is more than two (2) miles from a ground. The grounds shall be left in place until the conductor installation is completed between dead ends and shall be removed as the last phase of aerial cleanup.

- 2. If employees are working on bare conductors, grounds shall also be installed at each location where the employees are working, and grounds shall be installed at all open dead-end or catch-off points or next adjacent structure.
- 3. If two (2) bare conductors are to be spliced, the conductors shall be bonded and grounded before being spliced.

Reel handling equipment, including pulling and tensioning devices, shall be in safe operating condition and shall be leveled and aligned.

Load ratings of stringing lines, pulling lines, conductor grips, load-bearing hardware and accessories, rigging, and hoists may not be exceeded.

Each pull must be snubbed or dead ended at both ends before subsequent pulls.

Pulling lines and accessories shall be inspected prior to each use and replaced or repaired when damaged or when there is a reasonable basis to doubt the dependability of such lines or accessories.

Conductor grips shall not be used on wire rope, unless the grip is specifically designed for this application.

Reliable communications, through two-way radios or other equivalent means, shall be maintained between the reel tender and the pulling rig operator.

The pulling rig must be stopped if the conductor and pulling line hang-ups, or if slipping of the conductor grip occurs.

While the conductor or pulling line is being pulled (in motion) with a power-driven device, employees are not permitted directly under overhead operations or on the cross arm, except as necessary to guide the stringing sock or board over or through the stringing sheave.

Live-line bare hand work is prohibited.

When winches, trucks, or tractors are being used to raise poles, materials, to pull in wires, to pull slack or in any other operation, there shall be an operator at the controls unless the machinery or process is stopped.

Lead worker shall designate an employee to give signals when required.

Raising poles, towers or fixtures in the close proximity of high-voltage conductors shall be done under the supervision of a qualified electrical employee.

Employees shall not crawl over insulator strings but shall use a platform or other approved device to work from when making dead-ends or doing other work beyond strings of insulators, at such distance that they cannot reach the work from the pole or fixture. While working on the platform or other device, they shall be secured with safety straps or a rope to prevent falling. The provision of this subsection does not apply to extra high voltage bundle conductors when the use of such equipment may produce

additional hazard. Climbing over dead-end assemblies is permissible only after they have been completed and pinned in the final position.

TOWERS AND STRUCTURES

The following requirements apply to work performed on towers or other structures that support overhead lines.

The employee shall ensure that no employee is under a tower or structure while work is in progress, except where the employee can demonstrate that such a working position is necessary to assist employees working above.

Tag lines or other similar devices shall be used to maintain control of tower sections being raised or positioned, unless the employee can demonstrate that the use of such devices would create a greater hazard.

The load line may not be detached from a member or section until the load is safely secured.

A transmission clipping crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged.

FALL PROTECTION

Personal fall arrest systems shall meet the requirements of Chapter 296-155 WAC Part C-1.

Employees shall not work in elevated positions unless secured so as to prevent falling. They shall be secured by a safety belt or other approved means except when ascending, descending or moving from one location to another while in an elevated position. Before an employee throws his/her weight on a belt, the employee shall determine that the snap or fasteners are properly engaged. Only locking-type snaps hooks shall be used.

All line workers body belts, safety straps, lanyards, snaps or hooks, and other similar equipment shall be maintained in good condition and in accordance with the applicable safety rules and requirements.

Safety lines shall not be used for shock loading and shall be only used for emergency rescue. All safety lines shall be a minimum one-half inch (1/2) diameter and three (3) or four (4)-strand first-grade manila, or its equivalent, in strength (2,650 pounds) and durability. Defective lines shall not be used and shall be replaced.

Body belts with straps or lanyards shall be worn by employees working at an elevated position such as on poles, towers, or similar structures. Body belts and straps shall be inspected each day for defects before use. Defective body belts and straps shall not be used.

Employees shall not wear climbers while doing work where they are not required. Employees shall not continue to wear climbers while working on the ground; except for momentary or short periods of time.

Safety straps shall not be placed around poles above the cross-arm, except where it is not possible for the strap to slide or be slipped over the top of the pole inadvertently by the employee. Neither end of the strap shall be allowed to hang loose or dangle while the employee is ascending or descending poles or other structures.

Body belts and safety straps shall not be stored with sharp-edged tools or near sharp objects. When a body belt, safety strap, and climbers are kept in the same container, they shall be stored in such a manner as to avoid cutting or puncturing the material of the body belt or safety strap with the gaffs or climbers. Climbers must be stored with gaff guards on.

Climbing gaffs shall be kept properly sharpened and shall be at least one and one-eighth (1-1/8) inches in length.

Small tools carried in body belts shall be placed so as to present the least danger of coming into accidental contact with live parts. All tools carried in workers' body belts shall be sheathed.

Employees shall not attach metal hooks or other metal devices to body belts. Leather straps or rawhide thongs shall have hardwood or fiber crossbars. Leather straps and rawhide thongs shall not have metal or other conductive crossbars on them.

When working from a hook ladder, employees, must either belt themselves securely to the ladder, attach themselves to the structures by means of a safety line, or belt themselves to ladder-safety equipment, which shall consist of a safety rope or belting threaded through the rungs or secured to the ladder at intervals of not more than three feet.

Fall arrest, work position, or travel-restricting equipment shall be used by employees working in elevated locations more than four (4) feet above the ground on poles, towers, or similar structures if other fall protection has not been provided. Each qualified electrical employee climbing or changing location on poles, towers, or similar structures must use fall protection equipment unless the District can demonstrate that climbing or changing location with fall protection is infeasible or creates a greater hazard than climbing or changing location without it.

This section does not apply to buildings, loading docks, electrical equipment such as transformers or capacitors. See sections L and Q in the District's Accident Prevention Manual.

Employees learning to climb must use a fall-arrest system at all times when they are more than four (4) feet above ground until they are deemed a qualified electrical employee by the District.

The fall-arrest system must limit the maximum arresting force on an employee to 1800 pounds used with a body harness. The system shall be rigged such that employees can neither free fall more than six (6) feet nor contact any lower level.

If vertical lifelines or drop lines are used, only one (1) employee can be attached to a line.

Unless the snap hook is a locking type and designed specifically for the following connections, snap hooks on work-positioning equipment may not be engaged:

- i. Directly to webbing, rope, or wire rope;
- ii. To each other;
- iii. To a D-ring to which another snap hook or other connector is attached.
- iv. To a horizontal lifeline; or
- v. To any object that is incompatibly shaped or dimensioned in relation to the snap hook such that accidental disengagement could occur should the connected object sufficiently depress the snap hook keeper to allow release of the object.

UNDERGROUND

Each employee shall be knowledgeable of the equipment provided for his/her use and shall at all times use this equipment only for the purpose intended.

Protective barriers, or approved guards and warning signs must be erected before removing manhole covers or making excavations in places accessible to vehicular or pedestrian traffic.

Before any cover is removed, the employee shall determine whether it is safe to do so by checking for the presence of any atmospheric pressure or temperature differences and by evaluating whether there might be a hazardous atmosphere in the space. Any condition making it unsafe to remove the cover shall be eliminated before the cover is removed. See *Enclosed/Confined Space* section.

Before entering an enclosed or confined space employees shall comply with the provisions of Section O, *Enclosed/Confined Space*.

Whenever an opening is made in the street, it shall be properly guarded or covered until it is closed. Whenever an obstruction is left in the roadway after dark, it shall be marked with approved lights, flares or similar devices.

Trenching and excavating operations shall comply with the provisions of Section T, *Trenching and Shoring* of the Accident Prevention Manual.

A ladder or other climbing device shall be used to enter and exit a manhole or subsurface vault exceeding four (4) feet in depth. No employee may climb into or out of a manhole or vault by stepping on cables or hangers.

When open flames are used or smoking is permitted in manholes, adequate mechanical forced air ventilation shall be used.

Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of the manhole or excavation shall be tested and found safe or cleared of the combustible gases or liquids prior to the entry. When work is to be performed in manholes containing any wires or appliances carrying electrical current, the area shall be in a sanitary condition.

Care shall be taken to prevent the possibility of vehicles or pedestrians coming in contact with the wires and equipment.

Attendants for manholes/vaults

While work is being performed in a manhole containing energized electric equipment, an employee with first aid and CPR training shall be available on the surface in the immediate vicinity to render emergency assistance. The attendant can perform other duties outside the space if these duties do not distract them from monitoring employees within the space. See Section O *Enclosed/Confined Spaces* of the Accident Prevention Manual.

Employees entering manholes containing unguarded, un-insulated energized lines or parts of electric equipment operating at fifty (50) volts or more are required to be qualified electrical employee.

No work shall be permitted to be done in any manhole or subway on any energized wire, cable or appliance carrying more than 300 volts of electricity by less than two (2) qualified electrical employees who shall at all times, while performing such work, be in the same manhole or subway in which work is being done.

For the purpose of inspection, housekeeping, taking readings, or similar work, an employee working alone may enter, for brief periods of time, a manhole where energized cables or equipment are in service if the District can demonstrate that the employee will be protected from all electrical hazards.

Cable in manholes or underground vaults shall be accessible to employees and a clear working space shall be maintained at all times; and/or approved protective guards, barriers, etc., when installed shall be considered as providing adequate working clearance for cables over 5 kV. If a manhole and/or underground vault is determined to have an electrical or structural hazard, no work shall be done in the manhole and/or vault until the unsafe condition is corrected or the area to be worked is de-energized.

No work shall be performed on cables or equipment unless they have been properly identified by an approved method.

Reliable communications, through two-way radios or other equivalent means, shall be maintained among all employees involved in the job.

Equipment used to lower materials and tools into manholes or vaults shall be capable of supporting the weight to be lowered and checked for defects before use. Before tools or materials are lowered into the opening of a manhole or vault, each employee working in the manhole or vault shall be clear of the area directly under the opening.

Materials shall not be thrown into or out of manholes but shall be placed in the proper receptacle and hoisted in and out by means of a rope.

Tools and materials shall not be left on the ground around or near the manhole opening where they might be pushed or otherwise fall into the hole.

GUIDELINES FOR WORKING INSIDE OR FROM OUTSIDE ENERGIZED VAULTS

Scope

This guideline covers safe work practices when using proper tools and equipment for working on deenergized underground electrical cable(s)/equipment from in or outside a vault containing energized primary conductors. This guideline does not change current District practice for employees using live line tools to perform work without the need for an outage on energized cable(s)/equipment from outside an energized vault when deemed safe (i.e. switching).

References

November 3, 2004, Memorandum to Assistant General Manager of Distribution Services Division from the Joint Safety Committee, Guidelines for Working in or From Outside Energized Vaults.

This guideline is provided in addition to what is covered by WAC 296-45, WAC 296-45-215, WAC 296-45-255 (3&4), the District's Accident Prevention Manual - *Underground* section, and NESC 323 (B).

Definitions

Vaults not intended for full physical entry:

- Vaults less than six (6) feet from floor to inside roof.
- If circular in shape, less than six (6) feet in diameter.
- If square, less than six (6) feet from wall to wall.

Vaults intended for full physical entry:

• All other vaults and vault rooms.

Approach and Responsibility

- 1. Taking an outage before employees physically work on cable(s)/equipment from in or outside of an energized vault is the preferred work practice. This guideline would only apply if the foreman and crew can determine and agree upon a method to perform the task safely based on the following guideline. In all cases, the foreman has the responsibility to stop the job if it cannot continue to be accomplished safely.
- 2. The District and the contractor will provide the necessary tools, equipment and training for their respective line crew(s) to perform work in accordance with this guideline.
- 3. Each job should be evaluated according to the conditions that exist. When the job can be done safely, work will be performed in or from outside energized vault(s). This position is supported by the Washington Administrative Code (WAC 296-45-215).
- 4. An outage would not be required when:

- a. Work can be done safely and the vault is determined safe to work in by qualified electrical employees.
- b. Work can be done in a way that will allow for proper future operation of the cable(s)/equipment.
- 5. Vaults not intended for full physical entry:
 - a. When safe and proper protection can be provided, employees may reach into an energized vault to perform work.
- 6. Vaults intended for full physical entry:
 - Proper protection shall be provided and clearances observed for employees to perform work on cable(s)/equipment from in or outside of a vault having exposed energized equipment.
 Prior to an employee standing directly beneath energized switchgear, proper protection shall be installed to cover the bottom of energized switchgear with exposed electrical components to protect employee from both electrical and fault exposure.
 - b. Racking of cables and terminating cables in larger vaults would depend on the size of cable and arrangement of cables/equipment in the vault. Safe and proper protection shall be provided.
- 7. When appropriate, employees must install protection to prevent physical contact with energized cable(s)/equipment. Contact can be made between the de-energized cable(s) and energized cable(s)/equipment provided the cable(s)/equipment are properly insulated for the rated voltage. Rubber gloves can be worn as a secondary form of personal protection.

Duct rods. If duct rods are used, they shall be installed in the direction presenting the least hazard to employees. An employee shall be stationed at the far end of the duct line being rodded to ensure that the required minimum approach distances are maintained.

Multiple cables. When multiple cables are present in a work area, the cable to be worked shall be identified by electrical means, unless its identity is obvious by reason of distinctive appearance or location or by other readily apparent means of identification. Cables other than the one being worked shall be protected from damage.

Before cutting into a high-voltage cable or opening a high-voltage splice, the cable shall be de-energized then a clearance obtained, tested and then grounded in an approved manner. The cable to be worked on shall be identified by tags or equivalent means. For grounding requirements see *Grounding Section*, Section P of the Accident Prevention Manual. For clearance requirements, see the District's *Switching and Clearance Procedure Manual*.

Energized cables that are to be moved shall be inspected for defects.

Insulated platforms or other protective devices shall be provided when work is to be done on energized wires or equipment in manholes.

When pulling cable(s), all employees shall be made aware of the hazard of being caught in the sheaves, lashings or winch gears. All employees shall stand clear of the pulling line when the pull is begun or when the line is under tension. This rule applies to all work performed by means of a winch.

Fishing conduit or ducts. When fishing conduit or ducts, it shall first be determined that the fish tape or wires will not contact any energized line or equipment.

Where a cable in a manhole has one or more abnormalities that could lead to or be an indication of an impending fault, the defective cable shall be de-energized before any employee may work in the manhole, except when service load conditions and a lack of feasible alternatives require that the cable remain energized. In that case, employees may enter the manhole provided they are protected from the possible effects of a failure by shields or other devices capable of containing the adverse effects of a fault in the joint.

When work is performed on buried cable or on cable in manholes, metallic sheath continuity shall be maintained by bonding across the opening (or by equivalent means), or the cable sheath shall be treated as energized.

URD cables, which are properly insulated for the voltages to which they are energized, shall be considered as an effective barrier to protect employees and Table 2 need not apply.

Workers will take adequate precautions to avoid physical contact with energized URD cable by using approved procedures and/or protective devices.

When handling energized URD primary cables, two (2) qualified electrical employees shall do the work with approved tools and/or procedures. Switching is exempt from this rule.

When energized terminators or load-break elbows are handled by a hot stick, there shall be two (2) qualified electrical employees at the scene.

When energized pad-mounted transformers or similar equipment are to be left unlocked and open, they shall be attended by a qualified electrical employee.

Approved tools and procedures shall be used to remove any debris, vines, weeds, etc., from an underground system.

A primary and secondary system neutral on any energized circuit shall not be opened under any circumstances except for testing.

Primary and secondary neutrals shall be firmly connected and grounded before the circuit or equipment is energized.

Where different phases are in the same vault, enclosures, or parked in some manner that they could be looped, these phases shall be marked or identified.

600 Amp Single Blade Disconnect Switches

A load break tool must be used when opening this type of switch under load. This includes opening the switch to break a tie between two circuits.

Bayonet Fuses

Bayonet fuses shall not be closed into suspected faults or overloads.

Submersible UG transformer installations will require other methods of energizing or de-energizing and bayonet fuses shall not be used for this purpose.

Bayonet fuses shall only be operated after pad-mount transformers have been properly vented.

Bayonet fuses shall only be operated in accordance with manufacturing design and rating capabilities.

Kuhlman Transformers

Do not pull elbows to break load on Kuhlman-brand submersible transformers unless they are placarded "okay to switch." If there is any doubt as to whether or not a particular submersible transformer is a Kuhlman under load, do not operate the elbows on it until you have verified it in the field or with the Energy Control Center. For more information see *Standards Bulletin #181*.

Working on Cables

Before any work is to be performed on underground cables and/or apparatus' carrying high voltage, they shall be de-energized with the following exceptions:

- 1. Replacing fuses, operating switches, closing or opening load-break elbows, when approved protective devices are used.
- 2. Work in the high-voltage compartment of pad-mounted transformers and similar equipment installed above ground, provided the work is done by approved methods.
- 3. Only one energized conductor shall be worked on at any one time, and protective means shall be used to insulate or isolate it from all others.

SUSPECT TRANSFORMER TEST PROCEDURES

CAUTION: A transformer with an internal fault may explode causing injury or death.

Read carefully and follow these guidelines and testing procedure.

A transformer with an open fuse may have a buildup of explosive gasses in the tank. Re-fusing could cause the transformer to explode and spill hot oil and flames, endangering workers, customers and surroundings. The following guidelines are to reduce exposure to workers, customers and surroundings when re-energizing suspect transformers.

An outage involving a transformer with an open fuse is considered a suspect transformer in that it may be in a fault condition.

It is recommended that you use an extendo switching stick to get as far away as possible from potential faulted transformers when re-energizing. Use protective equipment for eyes and ears.

If the following testing guidelines indicate a faulty transformer, stop further testing procedures and replace the transformer.

Preferred Procedure

Warning: Ensure the transformer to be tested is de-energized.

Guidelines

- 1. If the transformer has a pressure-relief valve, relieve internal pressure by pulling valve ring. When pressure is released, start testing.
- 2. If a transformer has been hit by lightning, or is suspected to have been hit by lightning, or there are visible signs of oil leakage, assume the transformer is defective and replace it.
- 3. If an external cause is evident, such as a secondary fault or primary bushing faults (example: animal or bird is the obvious cause of the fuse blowing), and the transformer and bushing are not damaged, remove the cause and test the transformer (see *Testing Procedures*).
- 4. If no external cause is evident, proceed with testing the transformer (see *Testing Procedures*).

Testing Procedures

Warning: Ensure the transformer to be tested is de-energized.

- 1. Remove the hot line clamp(s) from the primary phase(s) to isolate the cutout(s) used to energize the transformer(s).
- 2. The Hastings TLC meter is the preferred instrument for use in determining the condition of your transformer(s) before placing them into service or back into service after being de-energized.
- 3. This hand-held tester has a built-in push-button test feature to use prior to applying it on a transformer. Whenever the TLC meter is operated, it



Hastings TLC Meter

performs a self-test on its audio alarm and LED indicators, as well as performing a low battery level check, before testing the connected transformer. Immediately following a self-test, the indication should be four audible beeps and a continuous red light. The self-test confirms the internal connectivity is intact, including the fuse inside the TLC. If the same test is repeated with the test leads left open, two audible beeps and a yellow OPEN LED will be indicated. This test does not test for an open fuse inside the TLC.

4. After

performing the self-test. disconnect the secondary leads and connect the test leads to the transformer you are testing. Press and hold the push-button until you obtain a continuous light (approximately 4 seconds). Before repeating a test, allow approximately two seconds for the TLC to reset itself after the push-button is released.

TLC (Transformer Last Check)

The below diagrams for single and double bushing overhead tarnsformers show various connections when using the 6793 tester. We have shown the reading that will be obtained "IF" the transformer is good.



Test Results: Red LED plus four fast beeps: SHORT Yellow LED plus two slow beeps: OPEN Green LED plus single beep: PASS

Note: It is a good practice to perform a self-test immediately after an **OPEN** indication by moving one test lead and connecting it to the other and pressing the push button and verifying a **SHORT** result. This will rule out possible open TLC test leads or a blown internal fuse.

5. Follow the testing diagram on the next page, and look for the correct meter indications as shown to be sure the transformer is good for continued use.

Note: No reading is not a guarantee the transformer is okay. It may still have a dangerous internal fault. If you have reason to suspect the transformer, replace it.

- 6. If you do not have a Hastings TLC Meter, you may test the transformer with an ohmmeter and follow the same connection diagram above. If you are looking for a green meter indication, the ohmmeter should indicate zero resistance. If you are looking for a yellow meter indication, the ohmmeter should indicate an infinite (∞) amount of resistance.
- 7. If you are satisfied the transformer is good, reconnect the leads, install the proper fuse and reenergize. Report to the Energy Control Dispatch the successful re-fusing and that the transformer has been energized. If the transformer is defective, report it to the ECC dispatcher and have the transformer replaced.

Testing and Test Facilities

This section provides for safe work practices for high-voltage and high-power testing performed in laboratories, shops, and substations, and in the field and on electric transmission and distribution lines and equipment. It applies only to testing involving interim measurements utilizing high voltage, high power, or combinations of both, and not to testing involving continuous measurements as in routine metering, relaying, and normal line work.

Routine inspection and maintenance measurements made by qualified electrical employees are considered routine line work and are not included in the scope of this section, as long as the hazards related to the use of intrinsic high-voltage or high-power sources require only the normal precautions associated with routine operation and maintenance work required in the other subsections of this section. Two typical examples of such excluded test work procedures are phasing-out testing and testing for a no-voltage condition.

The District shall establish and enforce work practices for the protection of each worker from the hazards of high-voltage or high-power testing at all test areas, temporary and permanent. Such work practices shall include, as a minimum, test area guarding, grounding, and the safe use of measuring and control circuits. A means for providing for periodic safety checks of field test areas shall also be included.

Employees shall be trained in safe work practices upon their initial assignment to the test area, with periodic reviews and updates as required by subsections of this section.

Permanent test areas shall be guarded by walls, fences, or barriers designed to keep employees out of the test areas.

In-field testing, or at a temporary test site where permanent fences and gates are not provided, one of the following means shall be used to prevent unauthorized employees from entering:

- 1. The test area shall be guarded by the use of distinctively colored safety tape that is supported approximately waist high and to which safety signs are attached; or
- 2. The test area shall be guarded by a barrier or barricade that limits access to the test area to a degree equivalent, physically and visually, to the barricade specified in this section; or

3. The test area shall be guarded by one or more test observers stationed so that the entire area can be monitored.

The barriers required by this section shall be removed when the protection they provide is no longer needed.

Guarding shall be provided within test areas to control access to test equipment or to apparatus under test that may become energized as part of the testing by either direct or inductive coupling, in order to prevent accidental employee contact with energized parts.

The District shall establish and implement safe grounding practices for the test facility.

All conductive parts accessible to the test operator during the time the equipment is operating at high voltage shall be maintained at ground potential except for portions of the equipment isolated from the test operator by guarding.

Wherever ungrounded terminals of test equipment or apparatus under test may be present, they shall be treated as energized until determined by test to be de-energized.

Visible grounds shall be applied, either automatically or manually with properly insulated tools, to the high-voltage circuits after they are de-energized and before work is performed on the circuit or item or apparatus under test. Common ground connections shall be solidly connected to the test equipment and the apparatus under test.

In high-power testing, an isolated ground-return conductor system shall be provided so that no intentional passage of current, with its attendant voltage rise, can occur in the ground grid or in the earth. However, an isolated ground-return conductor need not be provided if the District can demonstrate that both the following conditions are met:

- 1. An isolated ground-return conductor cannot be provided due to the distance of the test site from the electric energy source; and
- 2. Employees are protected from any hazardous step and touch potentials that may develop during the test.

In tests in which grounding of test equipment by means of the equipment-grounding conductor located in the equipment power cord cannot be used due to increased hazards to test personnel or the prevention of satisfactory measurements, a ground that the District can demonstrate affords equivalent safety shall be provided, and the safety ground shall be clearly indicated in the test set up.

When the test area is entered after equipment is de-energized, a ground shall be placed on the high-voltage terminal and any other exposed terminals.

High capacitance equipment or apparatus shall be discharged through a resistor rated for the available energy.

A direct ground shall be applied to the exposed terminals when the stored energy drops to a level at which it is safe to do so.

If a test trailer or test vehicle is used in field testing, its chassis shall be grounded. Protection against hazardous touch potentials with respect to the vehicle, instrument panels, and other conductive parts accessible to employees shall be provided by bonding, insulation, or isolation.

Control wiring, meter connections, test leads and cables may not be run from a test area unless they are contained in a grounded metallic sheath and terminated in a grounded metallic enclosure or unless other precautions are taken that the District can demonstrate as ensuring equivalent safety.

Meters and other instruments with accessible terminals or parts shall be isolated from test personnel to protect against hazards arising from such terminals and parts becoming energized during testing. If this isolation is provided by locating test equipment in metal compartments with viewing windows, interlocks shall be provided to interrupt the power supply if the compartment cover is opened.

The routing and connections of temporary wiring shall be made secure against damage, accidental interruptions and other hazards. To the maximum extent possible, signal, control, ground, and power cables shall be kept separate.

If employees will be present in the test area during testing, a test observer shall be present. The test observer shall be capable of implementing the immediate de-energizing of test circuits for safety purposes.

Safety Check

Safety practices governing employee work at temporary or field test areas shall provide for a routine check of such test areas for safety at the beginning of each series of tests.

The test operator in charge shall conduct these routine safety checks before each series of tests and shall verify at least the following conditions:

- 1. That barriers and guards are in workable condition and properly placed to isolate hazardous areas
- 2. That system test status signals, if used, are in operable condition
- 3. That test power disconnects are clearly marked and readily available in an emergency
- 4. That ground connections are clearly identifiable
- 5. That personal protective equipment is provided and used
- 6. That signal, ground, and power cables are properly separated

HAND AND PORTABLE POWERED TOOLS

The District shall ensure that each hand and portable powered tool, including any tool provided by an employee, is maintained in serviceable condition.

The District shall ensure that each tool, including any tool provided by an employee, is inspected before initial use during each work shift. At a minimum, the inspection shall include the following:

- 1. Handles and guards, to ensure that they are sound, tight-fitting, properly shaped, free of splinters and sharp edges, and in place;
- 2. Controls, to ensure proper function;
- 3. Heads of shock, impact-driven and driving tools, to ensure that there is no mushrooming;
- 4. Cutting edges, to ensure that they are sharp and properly shaped; and
- 5. All other safety devices, to ensure that they are in place and function properly.

The employee shall use the tool only for purposes for which it has been designed.

When the head of any shock, impact-driven or driving tool begins to chip, it shall be repaired or removed from service.

The cutting edge of each tool shall be sharpened in accordance with manufacturer's specifications whenever it becomes dull during the work shift.

Each tool shall be stored in the provided location when not being used at a work site.

Racks, boxes, holsters or other means shall be provided, arranged and used for the transportation of tools so that a hazard is not created for any vehicle operator or passenger.

Cord and plug-connected equipment supplied by premises wiring is covered by Chapter 296-24 WAC, Part L and WAC 296-800-280.

- 1. The portable tool is protected by an approved double insulating system or its equivalent and the tool is distinctively marked to show that it is double insulated; or
- 2. The power shall be supplied through an isolating transformer with an ungrounded secondary.

Any cord and plug-connected equipment supplied by other than premises wiring shall comply with one of the following:

- 1. It shall be equipped with a cord containing an equipment-grounding conductor connected to the tool frame and to a means for grounding the other end (however, this option may not be used where the introduction of the ground into the work environment increases the hazard to an employee); or
- 2. It shall be of the double-insulated type conforming to Chapter 296-24 WAC, Part L and WAC 296-800-280; or
- 3. It shall be connected to the power supply through an isolating transformer with an ungrounded secondary.

Portable and vehicle-mounted generators used to supply cord and plug connected equipment shall meet the following requirements:

- 1. The generator may only supply equipment located on the generator or the vehicle and cord and plug-connected equipment through receptacles mounted on the generator or the vehicle.
- 2. The non-current-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles shall be bonded to the generator frame.
- 3. In the case of vehicle-mounted generators, the frame of the generator shall be bonded to the vehicle frame.
- 4. Any neutral conductor shall be bonded to the generator frame.

Hydraulic and pneumatic tools must meet the following requirements:

- 1. Safe operating pressures for hydraulic and pneumatic tools, hoses, valves, pipes, filters, and fittings may not be exceeded.
- 2. If any hazardous defects are present, no operating pressure would be safe, and the hydraulic or pneumatic equipment involved may not be used. In the absence of defects, the maximum rated operating pressure is the maximum safe pressure.

A hydraulic or pneumatic tool used where it may contact exposed live parts shall (use non-conductive hoses and) be designed and maintained for such use.

The hydraulic system supplying a hydraulic tool used where it may contact exposed live parts shall provide protection against loss of insulating value for the voltage involved due to the formation of a partial vacuum in the hydraulic line.

Note: Hydraulic lines without check valves having a separation of more than thirty-five (35) feet between the oil reservoir and the upper end of the hydraulic system promote the formation of a partial vacuum.

A pneumatic tool used on energized electric lines or equipment where it may contact exposed live parts shall provide protection against the accumulation of moisture in the air supply.

Pressure shall be released before connections are broken, unless quick acting, self-closing connectors are used. Hoses may not be kinked.

Employees shall not use any part of their bodies to locate or attempt to stop a hydraulic leak.

Gasoline Engine Power Chain Saws

Employees whose duties require them to operate a chain saw shall wear flexible, ballistic, nylon pads, sewn or otherwise fastened into the trousers, or equivalent protection (chaps) that will protect the vulnerable areas of the legs.

Each chain saw shall be equipped with a chain brake. Any chain saw placed into service after February 9, 1995 shall be equipped with a protective device that minimizes chain saw kickback, i.e., reduced kickback bar, chains, bar tip guard or chain brake. No chain saw kickback device shall be removed or otherwise disabled.

The chain saw shall be operated and adjusted in accordance with the manufacturer's instructions.

The employee must inspect any chain saw initially before use during each work shift for at least the following;

- 1. The chain is properly adjusted
- 2. The muffler is operational
- 3. The chain brake and nose shielding devices are in place and properly functioning

The chain saw shall be fueled at least ten (10) feet from any open flame or other source of ignition.

The chain saw shall be started at least ten (10) feet from the fueling area.

The chain saw shall be started on the ground or where otherwise firmly supported. Drop starting a chain saw is prohibited.

The chain saw shall be started with the chain brake engaged.

The chain saw shall be held with the thumbs and fingers of both hands encircling the handles during operation unless the employee demonstrates that a greater hazard is posed by keeping both hands on the chain saw in that particular situation.

The chain saw operator shall be certain of footing before starting to cut. The chain saw shall not be used in a position or at a distance that may cause the operator to become off balance, have insecure footing or relinquish a firm grip on the saw.

Prior to felling any tree, the chain saw operator shall clear away brush or other obstacles that might interfere with cutting the tree or using the retreat path.

Chain saws shall not be used to cut directly overhead.

Chain saws shall be carried in a manner that will prevent operator contact with the cutting chain and muffler.

Chains saws shall be shut off or at idle before the feller starts his/her retreat.

The chain saw shall be shut down or the chain brake engaged whenever a saw is carried further than fifty (50) feet or when a saw is carried less that fifty (50) feet if conditions such as, but not limited to, the terrain, underbrush and slippery surfaces, may create a hazard for the employee.

When using a chain saw while working in a lifeline, a ballistic cover must be installed on each side of the lifeline or a double lifeline must be used.

Each power saw weighting more that fifteen (15) pounds that is used in trees/poles shall be supported by a separate line, except when work is performed from an aerial lift and except during topping or removing operations where no supporting limb will be available and the following:

- 1. Each power saw shall be equipped with a control that will return the saw to idling speed when released.
- 2. Each power saw shall be equipped with a clutch and shall be so adjusted that the clutch will not engage the chain drive at idling speed.

A power saw shall be started on the ground or where it is otherwise firmly supported. Drop starting of saws over fifteen (15) pounds is permitted outside of the bucket of an aerial lift only if the area below the lift is clear of personnel.

A power saw engine may be started and operated only when all employees other than the operator are clear of the saw.

A power saw may not be running when the saw is carried up into a tree by an employee.

Power saw engines shall be stopped for all cleaning, refueling, adjustments, and repairs to the saw or motor, unless the manufacturer's servicing procedures require otherwise.

LADDERS, PLATFORMS, AND MANHOLE STEPS

Portable ladders and platforms used on structures or conductors in conjunction with overhead line work shall meet the following requirements 296-876 WAC:

- 1. Ladders and platforms shall be secured to prevent them from becoming accidentally dislodged.
- 2. Ladders and platforms may not be loaded in excess of the working loads for which they are designed.
- 3. Ladders and platforms may be used only in applications for which they were designed.

In the configurations in which they are used, ladders and platforms shall be capable of supporting, without failure, at least 2.5 times the maximum intended load.

All ladders shall be handled and stored in such a manner as to prevent damage to the ladder.

When ascending or descending a ladder, the employee shall face the ladder and have free use of both hands.

All defective ladders shall be taken out of service and labeled as defective.

When a ladder is being used which is not fixed or otherwise secured, there shall be an attendant to hold the ladder and watch traffic when the work is being done on streets, alleys, sidewalks, or in industrial plants or other places where there exists the possibility of accidental contact with the ladder by third persons or vehicles.

When working on the ladder, employees shall, where possible, tie the top of the ladder to a substantial object to prevent falling unless the ladder is equipped with approved hooks which may be used for the same purpose.

Portable ladders shall not be moved with employees on the ladder.

No employee shall ascend or descend a rolling ladder while it is moving.

No employee shall stand on the top two steps of a stepladder.

No employee shall use a stepladder as a straight ladder.

Ladders shall always be placed on a secure footing with both legs resting firmly on the lower surface.

Ladders made by fastening cleats or similar devices across a single rail shall not be used.

Conductive ladders. Portable metal ladders and other portable conductive ladders may not be used near exposed energized lines or equipment. However, in specialized high-voltage work, conductive ladders shall be used where the employer or District can demonstrate that nonconductive ladders would present a greater hazard than conductive ladders.

Note: A greater electrical hazard would be static electricity such as might be found in extra high voltage substations.

All conductive or metal ladders shall be prominently marked and identified as being conductive and shall be grounded when used near energized lines or equipment. For additional ladder requirements see *Section R* of the Accident Prevention Manual.

Substations

This section provides additional requirements for substations and work performed in them.

The following rules shall not apply to the use of existing electrical installations during their lifetime. Provided they are maintained in good condition and in accordance with the applicable safety factor requirements and rules in effect at the time they were installed, and that reconstruction shall conform to the rules as herein provided.

Access and working space. Sufficient access and working space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment.

Note: Guidelines for the dimensions of access and working space about electric equipment in substations are contained in National Electrical Safety Code (NESC), ANSI C2-2012. An installation that does not conform to this ANSI standard will, nonetheless, be considered as complying with WAC 296-45-475 (1) if the District can demonstrate that the installation provides ready and safe access based on the following evidence:

- 1. That the installation conforms to the edition of ANSI C2 that was in effect at the time the installation was made;
- 2. That the configuration of the installation enables employees to maintain the minimum approach distances required by WAC 296-45-325 (5) while they are working on exposed, energized parts; and

3. That the precautions taken when work is performed on the installation provide protection equivalent to the protection that would be provided by access and working space meeting ANSI C2-2012.

Draw-out-type circuit breakers: When draw-out-type circuit breakers are removed or inserted, the breaker shall be in the open position. The control circuit shall also be rendered inoperative if the design of the equipment permits. Remote racking is available in many of the District's substations that contain draw-out-type circuit breakers. At stations where it is installed, the remote racking equipment should be used whenever circuit breakers are racked into or out of an energized bus.

Substation fences: Conductive fences around substations shall be grounded. When a substation fence is expanded or a section is removed, fence-grounding continuity shall be maintained, and bonding shall be used to prevent electrical discontinuity. Grounding is not required on an insulated fence.

• A temporary fence offering similar protection when the site is unattended must be provided. Adequate interconnection with grounds must be maintained between temporary fence and permanent fence.

Guarding of rooms containing electric supply equipment: Rooms and spaces in which electric supply lines or equipment are installed shall meet the requirements of WAC 296-45-475 (4)(b)-(e) under the following conditions:

- 1. If exposed live parts operating at 50 to 150 volts to ground are located within eight (8) feet of the ground or other working surface inside the room or space;
- 2. If live parts operating at 151 to 600 volts and located within eight (8) feet of the ground or other working surface inside the room or space are guarded only by location, as permitted under subsection (5)(a) of this section; or

If live parts operating at more than 600 volts are located within the room or space, unless:

- 1. The live parts are enclosed within grounded, metal-enclosed equipment whose only openings are designed so that foreign objects inserted in these openings will be deflected from energized parts; or
- 2. The live parts are installed at a height above ground and any other working surface that provides protection at the voltage to which they are energized corresponding to the protection provided by an 8-foot height at fifty (50) volts.

The rooms and spaces shall be so enclosed within fences, screens, partitions, or walls as to minimize the possibility that unqualified persons will enter.

Signs warning unqualified persons to keep out shall be displayed at entrances to the rooms and spaces.

Entrances to rooms and spaces that are not under the observation of an attendant shall be kept locked.

Unqualified persons may not enter the rooms or spaces while the electric supply lines or equipment are energized.

Guarding of Energized Parts

Guards shall be provided around all live parts operating at more than 150 volts to ground without an insulating covering, unless the location of the live parts gives sufficient horizontal or vertical or a combination of these clearances to minimize the possibility of accidental employee contact.

- 1. That the installation conforms to the edition of ANSI C2 2012 that was in effect at the time the installation was made;
- 2. That each employee is isolated from energized parts at the point of closest approach; and
- 3. That the precautions taken when work is performed on the installation provide protection equivalent to the protection that would be provided by horizontal and vertical clearances meeting ANSI C2-2012.

Except for fuse replacement and other necessary access by qualified electrical employees, the guarding of energized parts within a compartment shall be maintained during operation and maintenance functions to prevent accidental contact with energized parts and to prevent tools or other equipment from being dropped on energized parts.

When guards are removed from energized equipment, barriers shall be installed around the work area to prevent employees who are not working on the equipment, but who are in the area, from contacting the exposed live parts.

Substation Entry

Upon entering an attended substation, each employee other than those regularly working in the station shall report their presence to the employee in charge in order to receive information on special system conditions affecting employee safety.

The job briefing must be performed and shall cover such additional subjects as the location of energized equipment in or adjacent to the work area and the limits of any de-energized work area.

Testing and Test Facilities and Safety Check

Please refer to pages 26-30 in this section (Section N: Transmission, Distribution, and Substation).

POWER GENERATION

This section provides additional requirements and related work practices for power generating plants.

Interlocks and other safety devices shall be maintained in a safe, operable condition.

No interlock or other safety device may be modified to defeat its function, except for test, repair, or adjustment of the device.

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

The following rules shall not apply to existing electrical installations during their lifetime, provided they are maintained in good condition and in accordance with the applicable safety factor requirements and rules in effect at the time they were installed, and that reconstruction conforms to the rules as provided herein.

Sufficient access and working space shall be provided and maintained around electric equipment to permit ready and safe operation and maintenance of such equipment.

Guidelines for the dimensions of access and workspace about electric equipment in generating stations are contained in National Electrical Safety Code (NESC), ANSI C2-2012. An installation that does not conform to this ANSI standard will, nonetheless, be considered as complying with this section if the District can demonstrate that the installation provides ready and safe access based on the following evidence:

- 1. The installation conforms to the edition of ANSI C2 in effect at the time the installation was made;
- 2. The configuration of the installation enables employees to maintain the minimum approach distances required by this section while they work on exposed, energized parts; and
- 3. The precautions taken when work is performed on the installation provide protection equivalent to the protection that would be provided by access and working space meeting ANSI C2-2012.

Guarding of Rooms Containing Electric Supply Equipment

Rooms and spaces in which electric supply lines or equipment are installed shall meet the requirements of WAC 296-45-48520, under the following conditions:

- 1. If exposed live parts operating at 50 to 150 volts to ground are located within eight (8) feet of the ground or other working surface inside the room or space;
- 2. If live parts operating at 151 to 600 volts and located within eight (8) feet of the ground or other working surface inside the room or space are guarded only by location, as permitted under this section; or
- 3. If live parts operating at more than 600 volts are located within the room or space; unless:
- 4. The live parts are enclosed within grounded, metal-enclosed equipment whose only openings are designed so that foreign objects inserted in these openings will be deflected from energized parts; or
- 5. The live parts are installed at a height above ground and any other working surface that provides protection at the voltage to which they are energized corresponding to the protection provided by an eight-(8) foot height at 50 volts.

The rooms and spaces shall be so enclosed within fences, screens, partitions, or walls as to minimize the possibility that unqualified persons will enter.

Signs warning unqualified persons to keep out shall be displayed at entrances to the rooms and spaces.

Entrances to rooms and spaces not under the observation of an attendant shall be kept locked.

Unqualified persons may not enter the rooms or spaces while the electric supply lines or equipment are energized.

Guarding of Energized Parts

Guards shall be provided around all live parts operating at more than 150 volts to ground without an insulating covering, unless the location of the live parts gives sufficient horizontal, vertical or a combination of these clearances to minimize the possibility of accidental employee contact unless;

- 1. Each employee is isolated from energized parts at the point of closest approach;
- 2. Precautions taken when work is performed on the installation provide protection equivalent to the protection that would be provided by horizontal and vertical clearances meeting ANSI C2-2012.

Except for fuse replacement or other necessary access by qualified electrical employees, the guarding of energized parts within a compartment shall be maintained during operation and maintenance functions to prevent accidental contact with energized parts and to prevent tools or other equipment from being dropped on energized parts.

When guards are removed from energized equipment, barriers shall be installed around the work area to prevent employees who are not working on the equipment, but who are in the area, from contacting the exposed live parts.

Hydro Plants and Equipment

Employees working on or close to water gates, valves, intakes, forebays, flumes, or other locations where increased or decreased water flow or levels may pose a significant hazard shall be warned and shall vacate dangerous areas before water flow changes are made.

Personal Flotation Devices

Whenever an employee may be pulled, pushed or may fall into water where the danger of drowning exists, the employee shall be provided with and use U.S. Coast Guard approved personal flotation devices.

Each personal flotation device shall be maintained in safe condition and inspected frequently enough to ensure it does not have rot, mildew, water saturation or any other condition that could render it unsuitable for use.

An employee may cross streams or other bodies of water only if a safe means of passage, such as a bridge, is provided.

SUBSTATION ESCORT AND SAFETY WATCH GUIDELINES

1. Purpose and Scope

The purpose of this document is to provide guidance on requirements for non-qualified/ qualified person(s) to enter a District substation. It also provides guidance on what level of instruction must be provided to people who access substations owned and operated by Snohomish PUD. There are a variety

of activities that could take place in a substation, and these guidelines comply with WAC and consider the risks to people who perform these activities within a substation.

These guidelines apply only to substations that are part of the District's electrical system, and specifically exclude any substations that are under construction and do not have transmission or distribution lines terminated from the District's electrical system into the substation. These guidelines also exclude substations that are temporarily removed from the District's electrical system by disconnecting all transmission and distribution lines, including the system neutrals, into that substation. Both of the situations listed above result in a substation that is not part of the District's electrical system.

2. Substation Entry Requirements

WAC -296-45 Electric Power Generation, Transmission, Distribution provides the legal requirements for the safety of persons entering an energized substation and the minimum approach distance to exposed energized parts inside the substation. WAC-296-45-475 section 4e states that **"unqualified persons may not enter the rooms or spaces while the electric supply lines or equipment are energized."** It is the responsibility of the District to determine what level of instruction and proficiency are necessary before permitting its employees, contractors or visitors to enter a District-owned substation to perform their duties. This guideline assumes that District-provided training would permit a person to enter an energized substation; however, there could be situations where previous training received elsewhere could qualify a person to enter and/or work in a District substation, if that training was equivalent to District-provided training and the District qualifies them.

Tasks which have a greater risk of electrical contact would necessitate a higher level of proficiency by the person performing that task. For example, a visitor who is escorted by a trained employee might need only a job briefing if they maintain large distances to any energized equipment, but a contractor operating a crane in close proximity to energized circuits would require formalized training with demonstration and documentation of proficiency. Therefore certain zones are defined and categories of work are established to customize the desired training and proficiency to the risks that would be encountered. These guidelines provide a structured and consistent framework for making decisions regarding substation access, escort requirements, and work permitted under a variety of situations that may be encountered.

3. WAC 296-45 and 296-155 Distance Requirements

WAC 296-155-428 is the state's legal requirements (as required by OSHA 1910.333) for protection of persons working in proximity of electric power circuits. WAC 296-155-428 states that no work shall be performed within a distance of less than ten (10) feet from any uncovered power lines over 600 volts. If the voltage in the line exceeds 50 kV, the required distance increases by 0.4 inches for each kilovolt over 50 kV. The required distance from a 115 kV conductor is twelve (12) feet and two (2) inches, calculated by adding 65 kV * 0.4" per kV to the minimum ten (10) feet, for a total of ten (10) feet and twenty-six (26) inches, or twelve (12) feet two (2) inches.

WAC 296-155-428, part (j), items i and ii exempt qualified electrical employees of electrical systems covered under WAC 296-45, which allows those employees to approach energized circuits more closely

than others are permitted. Because ground clearance to energized conductors in a substation may be less than overhead conductors accessible to the general public, access to substations shall be restricted to qualified electrical employee(s) or those who are under the direct control of a qualified electrical employee as defined in this document.

While WAC 296-155 mainly applies to the general public operating outside substations, these approach distances must also be maintained for escorted visitors or contractors who do not receive documented training with demonstration of their proficiency. WAC 296-45 allows people who are qualified electrical employees to approach energized conductors more closely than the general public is allowed. These minimum approach distances are specified in Table 2 of WAC 296-45-325 and repeated in the District's Accident Prevention Manual (APM) page N-5, which specifies a phase to ground and phase to phase distance for certain voltage ranges. Table 2 is summarized below, leaving out the voltage ranges not applicable at the District. This table is only applicable if the employees are deemed to be qualified.

Nominal kV (A.C.)		
(phase to phase)	Phase to Ground exposure	Phase to Phase exposure
0 to 0.050	Not specified	Not specified
0.051 to 0.300	Avoid contact	Avoid contact
0.301 to 0.750	1'2"	1′2″
0.75 – 15 kV	2'2"	2'3"
46.1 – 72.5 kV	3'3"	4'0"
72.6 – 121 kV	3'9"	4′8″
230 -242 kV	6'8"	10'2"

Table 2 from WAC 296-45, up through 242 kV

WAC section 296-45-065 addresses required training of electrical workers. Part 1 states that: qualified electrical employees shall also be trained and competent in:

- a. Skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
- b. Skills and techniques necessary to determine the nominal voltage of exposed live parts.
- c. Minimum approach distances, corresponding to the voltages to which the qualified electrical employee will be exposed and the skills and techniques necessary to maintain those distances.
- d. Proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment."

e. Recognition of electrical hazards to which the employee may be exposed and the skills and techniques necessary to control or avoid these hazards.

WAC 296-475 and the District's APM section N (pages 34-36) address special substation requirements. Both the District's APM and WAC 296-45-475 sections 6 a) & b) require that any employee entering a substation shall report their presence to the employee in charge and receive a job briefing. A recent addition to WAC 296-45-475 defines requirements for a safety watch in substations. The new addition, part 6 c) states:

Safety Watch. Nonqualified persons may only approach energized electrical equipment located in substations or switch yards up to the distances set forth in WAC 296-45-325, Table 2 when under the direct supervision of a qualified electrical employee acting as a safety watch. The safety watch must ensure the nonqualified person does not encroach or take conductive objects closer to energized parts than set forth in Table 2.

- i) Safety watch must be a qualified electrical employee as defined by WAC 296-45-035.
- ii) Safety watch will have the responsibility and authority to monitor work on a continuous basis and/or stop the work until the hazard is eliminated or protected.
- iii) Safety watch will maintain a direct line of sight and voice communication with all non-qualified persons under his/her direct supervision. If the safety watch cannot meet these requirements, additional safety watches must be assigned or work will be stopped. In any case, safety watch will monitor no more than four (4) persons.
- iv) Safety watch will perform no other duties while acting as a safety watch.
- v) Non-qualified persons must have hazard recognition training and attend a documented tailgate meeting prior to entering the substation.

Proposed alternative to (v): Prior to entering the substation, non-qualified persons must attend a documented tailgate meeting that includes hazard recognition training."

4. Definitions of zones and the terminology:

The WAC allows the employer to establish more stringent safety rules than those presented in WAC-296-45. The District has defined additional requirements for persons within an energized substation. These requirements are represented by establishing three (3) safety zones within an energized substation. The three zones are defined as follows (Refer to figures 1 and 2 on page 8 illustrating typical examples of the three zones):

Zone 1: is the substation yard between the security fence and the outer boundaries of zone 2. Nonqualified persons may enter this zone with the escort of a qualified electrical District employee after receiving the required documented safety briefing to ensure the person knows and understands hazards and safe work practices.

Zone 2: is the envelope around uncovered energized parts whose outside boundary is the distance specified by WAC 296-155 and whose inside boundary is the outer boundary of zone 3. The dimension

for the outer boundary is ten (10) feet from the energized parts with voltages at 50 kV or less. This dimension increases by 0.4 inches for each kilovolt over 50 kV (Approach distance for 115 kV bus is 12'2"). Non-qualified persons may enter this zone after receiving the required documented safety briefing and only when escorted by a qualified electrical safety watch District employee.

Zone 3: is the envelope whose outer boundary is defined in WAC-296-45-325, Table 2, and is the minimum approach distance to exposed energized parts that no person can be within unless they are electrically qualified in the specific safe work practices. Otherwise, this zone is prohibited from entry unless the equipment is de-energized and grounded.

Definitions of terms used:

- **Entry qualified**: Person who has received training and is proficient in the hazards and safety-related work practices for tasks performed within a substation. Able to enter a substation alone.
- **Escort qualified**: District employee who is trained and proficient in the hazards and safety related safe work practices within a substation, and is able to provide a simple job briefing to non-qualified person(s) on substation hazards for safe entry for the work to be performed. This briefing must ensure that the person knows and understands the hazards and safe work practices for the work being performed, and allows the visitor to enter zone 1 of a substation.
- **Qualified electrical employee**: Person who is familiar and knowledgeable in the construction and operation of the electric power generation, transmission, and distribution equipment involved, and such lines and/or equipment that concerns his/her position and who is fully aware of the hazards connected therewith, or, one who has passed a journey status examination for the particular branch of the electrical trades with which he/she is connected.
- **Safety Watch** A District employee who is trained and proficient in the hazards and safety-related safe work practices within a substation, and is able to provide a detailed job briefing for non-qualified person(s) performing physical work (defined as category two or higher).
- **Uncovered** Conductors that do not have an insulation coating. Underground cables and the bus inside a control building are covered. Bare wire and bus in substations are uncovered.
- **Unqualified or Non-qualified** A person who has not had the necessary training to come closer to energized conductors or equipment than allowed per WAC 296-155-428 (minimum distance of ten [10] feet). For the purpose of this guideline, it is used only as a method of defining an approach distance. WAC 296-45-475 part 6c defines requirements for non-qualified persons to enter a substation with a safety watch.

The differences between an escort and safety watch are:

• An escort can bring visitors into a substation for purposes of observation, inspection, or simple deliveries. The safety watch can monitor workers who are performing physical assembly, using machinery, and performing construction activities.
- The visitor accompanied by an escort is permitted in zone 1 only, but a safety watch may take persons into zone 2.
- The training requirements for a safety watch are greater than for an escort. A person who is qualified as a safety watch may perform duties as an escort, but the escort training does not permit the employee to act as a safety watch.
- The safety watch checklist is more comprehensive than the escort checklist.

5. District Employee Access

District employees will be considered as entry qualified and granted access privileges to enter energized substations alone if they have attained:

- Journeyman or Foreman-level status as a Wireman, Relayman, Lineman, Meterman, Communications Technician, **OR**
- Substation Engineers who have been trained and currently certified as qualified electrical employees in accordance with WAC-45-065, **OR**
- Have completed the District's Substation Hazard Awareness course or refresher class within the previous year.

District employees who do not meet any of the qualifications listed above **must** be escorted by a person who is a qualified electrical employee and who is escort-qualified as defined in section #4.

6. Contractors and Other Visitors Entry into a Substation

Employees of electrically qualified contractors working for the District will be granted access privileges to enter energized substations unescorted only if they are a qualified electrical employee as defined in section #4. All other persons may enter an energized Snohomish PUD substation only when accompanied by a District employee who has received training to be their escort or safety watch. The qualification level required for the District employee and documentation necessary will vary depending on the work performed. In all cases, the non-qualified person must know and understand the hazards and safe work practice for the work being performed before entering the substation. The four categories of work by non-qualified persons have been defined in the next section. The requirements for permitting non-qualified persons inside a substation are summarized in the matrix at the end of this document.

7. Category One, Two, Three, and Four Work – Definition & Escort Req.

Category One Work: Observation, Inspection, and Simple Deliveries

Activities performed in the substation that place the visitor at a distance greater than the WAC 296-155-428 specification. The escort may enter zone 2, but the worker must remain in zone 1. Work may involve walking through, observing, inspecting, monitoring, touring, taking readings, using a hand-held camera, carrying materials, and similar activities that are largely passive in nature and do not affect the physical or electrical condition of the facility. Examples:

- Visual observations and inspections (e.g., safety, engineering)
- Visual verification of drawings (not involving conductive measuring devices)
- Pre-bid walk through with contractor
- Providing a tour of the substation
- Unloading material in an area of the substation away from energized equipment
- Parking a vehicle inside the gate of a substation away from energized equipment

Category Two Work: Non-electrical Physical Work Outside the WAC 296-155-428 Distance

Work performed that always exceeds the distance specified by WAC 296-155-428 (limited to zone 1). The PUD employee must have safety watch" training. The safety watch may enter zone 2, but the worker must remain in zone 1. The work may include the person's use of his/her hands, tools, controls, or other means to manipulate, operate, or affect the condition of machinery, equipment, vehicles, soil, or physical plant that is not part of the electrical system within the facility. Examples:

- Building or grounds maintenance, including controlling weeds, repairing fencing, servicing a portable toilet inside the substation.
- Operating a backhoe, trencher, forklift, or other mechanized equipment
- Digging by hand, including taking soil samples
- Delivering rock, concrete, and construction materials
- Cleaning up oil spills

Category Three Work: Physical Work Inside WAC 296-155-428 Distances

Physical work that has the potential to encroach closer than the distance specified by WAC 296-155-428, but is still outside the WAC 296-45-325 Table 2 distances. Both the safety watch and the workers may enter zone 2. The nature of activity is the same as category two, but the difference is that the workers or their equipment may enter zone 2 and come within the minimum safe working distance defined by WAC 296-155-428. The critical distance is ten (10) feet at voltages from 601 volts through 50 kV, and incrementing 0.4"/kV for voltages above 50kV (see *section #2* above).

Category Four Work: Electrical Work or Physical Work above Insulator Level

Category four would apply in situations when:

- The safety watch must obtain a clearance so worker(s) can perform the assigned tasks, OR
- Work has the potential to encroach closer than the WAC 296-155-428 distance, AND is above the level of the station insulators (example crane work in proximity of bus).

Category four work shall be continuously supervised by a Substation Foreman. The worker must receive substation hazard training off-site prior to beginning their job activity in the substation, and the job

briefing must be documented. Work would take place in zone 2 above insulator level, OR if the lines and equipment are de-energized and grounded, work may take place in zone 3.

The escort requirements for the categories defined above are:

- **Category One Work**: The escort must be a District qualified electrical employee who meets the qualifications to enter the substation alone, and is able to provide a documented job briefing to other visitors on substation hazards and safe work practices. The escorted visitor(s) must clearly understand hazards and safe work practices before entry is allowed.
- **Category Two Work**: The safety watch must be a District qualified electrical employee to provide a documented job briefing covering items in the safety watch checklist applicable to the work performed. The worker(s) must clearly understand hazards and safe work practices before entry.
- **Category Three Work**: The safety watch must be a District qualified electrical employee to provide a documented job briefing covering items in the safety watch checklist applicable to the work performed. The worker(s) must clearly understand the hazards and safe work practices before entry.
- **Category Four Work**: The safety watch must be a substation wireman or foreman. The worker(s) must receive training off-site prior to beginning their job activity in the substation, and the safety watch must perform a documented job briefing using the safety watch checklist. The worker(s) must clearly understand the hazards and safe work practices for the tasks to be performed before allowing entry.

8. Substation Escort and Safety Watch Checklists

Since the tailgate meeting must be documented before non-qualified persons can enter a substation, the District has developed two checklists to assist the escort or safety watch with the job briefing. For category one activities, use the substation escort checklist for category one activities. The escort should return this form to their supervisor after returning from the substation.

For category two through four work, use the safety watch checklist for category two or above work. The checklist must be filled out and returned to their supervisor after it is completed. The safety watch initials the center column of this form, and each person receiving the briefing should initial the left-most column. By initialing the job briefing checklist, a worker is acknowledging that he/she knows and understands the hazards and safe work procedures for the activity to be performed. Another job briefing must be conducted for workers added to the project. At the start of each work day, the safety watch must review the hazards and safe work procedures change, a new documented. If the activity changes and the hazards or safe work procedures change, a new documented checklist is required.

Remember that one escort or safety watch may monitor a maximum of four (4) non-qualified persons. If more than four (4) non-qualified persons are present, additional safety watches are required.

SUBSTATION ESCORT CHECKLIST FOR CATEGORY ONE ACTIVITIES

The following checklist should be used by the substation escort when performing the job briefing with a non-qualified visitor to a substation. This checklist is only valid for activities in the substation that place the person being escorted at a distance greater than the WAC 296-155-428 specification, which is ten (10) feet for voltages up to 50 kV, and 12'2" for 115 kV conductors. The purpose is to ensure the visitor knows and understands the hazards associated with visiting a substation. This checklist must be documented and returned to the escort's supervisor. The visitors initial the left column and the substation escort initials the center column.

Initial Visitor	Initial Escort	Task				
		Explain your role as the qualified electrical District employee in charge and let the visitor know that you have authority to stop their activities if unsafe conditions are observed.				
		Review scope of work with the visitor.				
		Point out what equipment is energized and de-energized. Let the visitor know what voltages are present around the work area				
		State that the visitor must keep a distance greater than the WAC 296-155-428 distance from any energized and exposed conductors.				
		Explain that the fence and equipment frames are grounded. Instruct the visitors not to lean against or touch the fence or equipment.				
		Remind the visitor that metal ladders, survey rods, or tape measures are prohibited inside the station.				
		Explain evacuation procedures and what to do if something happens in the station that would require them to exit.				
NOTE: If more than four non-qualified persons are present, additional escorts are required.						
LOCATION:			DATE:			
DISTRICT EMP	LOYEE ESCORT:					
VISITORS:						

SAFETY WATCH CHECKLIST FOR ACTIVITIES IN CATEGORY TWO OR ABOVE

The following checklist should be used by the substation safety watch when performing the job briefing with workers, to ensure the workers know and understand the hazards and safe work procedures for their assigned activity inside a substation. This checklist must be documented and returned to the department manager whenever category two, three or four activities take place. Workers on the crew initial the left column and the substation safety watch initials the center column. The job briefing must be conducted for workers added to the project. At the start of each work day, the safety watch must review the hazards

and safe work practices, but this is not required to be documented. If the activity changes and the hazards or safe work procedures change, a new documented job briefing is required.

Initial	Initial	
Contract	Safety	
Worker	Watch	Task
		Explain your role as the qualified electrical District employee in charge and
		let the contract worker know that you have authority to stop their work if
		unsafe conditions are observed.
		Review scope of work with the contract worker.
		Provide a copy of the District's "Electrical Safety for Contractors booklet.
		Point out what equipment is energized and de-energized. Explain and
		ensure worker(s) knows the voltages that are present around the work
		area
		Explain and ensure the worker(s) understand the safe working clearances
		that must be maintained from energized equipment (Accident Prevention
		Manual Page N-4).
		Discuss how to work around substation ground grid. Explain that parallel
		path must be maintained for the ground grid and that any replacement
		ground conductor must be same size or larger.
		Explain that the fence and equipment frames are grounded. Instruct
		worker(s) not to lean against or touch the fence or equipment. Discuss
		grounding of trucks and equipment if used inside the station.
		Remind contract worker that metal ladders, survey rods, or tape measures
		are prohibited inside the station.
		Verify that contract workers have the proper Personal Protective
		Equipment (PPE) for the tasks they are assigned. Consider safety glasses,
		hearing protection, footwear, gloves, hard hats, chemical PPE, etc.

SUBSTATION ESCORT DUTIES – WORK CATEGORY MATRIX

This matrix defines the requirements for substation escorts needed to provide a safety watch inside Snohomish County PUD substations for various categories of work performed.

	Category One	Category Two	Category Three	Category Four	
Description Of Category	Activities performed that always exceed the minimum safe working distance for non-qualified persons involving walking through, observing, inspecting, monitoring, touring, taking readings, using a hand-held camera, carrying materials, and similar activities that are largely passive in nature and do not affect the physical or electrical condition of the facility.	Activities performed that always exceed the minimum safe working distance for non-qualified persons in which persons use their hands, tools, controls, or other means to manipulate, operate, or affect the condition of machinery, equipment, vehicles, soil, or physical plant that are not part of the electrical system within the facility.	Physical work performed by a qualified electrical employee(s) that has the potential to encroach closer than the minimum safe working distance for non- qualified persons, but is still outside the WAC Table 2 distances allowed. These activities are the same as Category Two, but the difference is that the worker or their equipment may come within the minimum safe working distance for non-qualified persons.	Category Four would apply in situations when the Safety Watch must obtain a clearance so that the qualified electrical employee can perform the assigned tasks, OR work performed has the potential to encroach closer than the minimum safe working distance for unqualified persons, AND is above the level of the station insulators.	
Zones of work allowed	Zone 1 for worker Zone 1 or 2 for escort	Zone 1 for worker Zone 1 or 2 for safety watch	Zone 1 or 2 for worker and safety watch	Zone 1 or 2 for worker and safety watch, unless a clearance is issued and grounds in place.	
Escort/Watch Requirements	An escort-qualified electrical District employee. Maximum of four visitors per escort.	A District employee who is qualified as a Safety Watch. Maximum of four workers per safety watch.	A District employee who is qualified as a Safety Watch. Maximum of four workers per safety watch.	Substation Wireman/Foreman who is a qualified Safety Watch. See CBA 8.2.4.4 for HF upgrade.	
Job Briefing Requirements	Documented job briefing required to point out hazards, identify voltage levels in the station, and energized parts. The visitor must understand hazards and safe work practices for the task.	The job briefing must be documented using the "Safety Watch Checklist" and returned to the department manager. Escorted worker must understand hazards and safe work practices for the task.	The job briefing must be documented using the "Safety Watch Checklist" and returned to the department manager. Escorted worker must understand hazards and safe work practices for the task.	The job briefing must be documented, and substation electrical hazard training shall be provided to the contract worker prior to beginning any category Four tasks. Escorted worker must understand hazards and safe work practices for the task.	



Figure #1 – Graphical description of zones, transmission voltage

Zone 1: is the substation yard between the security fence and the boundaries of zone 2. Visitors may enter this zone with an escort qualified electrical employee and after receiving the required safety briefing.

Zone 2: is the envelope around energized parts whose outside boundaries are the distance required by unqualified persons per WAC 296-155 and whose inside boundaries are the minimum approach distances for the applicable voltages listed in WAC-296-45-325, Table 2. The dimension for the outer

boundary is ten (10) feet from the energized parts with voltages at 50 kV or less. This dimension increases by 0.4 inches for each kilovolt over 50 kV (115 kV bus approach distance is twelve [12] feet two [2] inches). Visitors are only allowed to enter this zone when escorted by a District qualified safety watch who has received training.

Zone 3: is the envelope whose boundaries are defined in WAC-296-45-325, Table 2, and is the minimum approach distance to exposed energized parts that no person can be within. This zone is prohibited to enter unless the equipment is de-energized, tested, grounded, and a clearance holder supervises the work.

Initial	Initial						
Worker	Safety Watch	Task					
		Remind contract workers that hard hats are mandatory when overhea hazards or other head injury risks (such as flying objects) are present.					
		Explain what to do if underground obstacles are encountered. Remind contract workers about trench safety requirements (APM page T-1 or WAC 296-155-657), and state that excavation areas should be barricaded.					
		Ask contract workers to remove all items that would be a safety hazard at the end of each workday, since PUD employees may need access at night.					
		Explain evacuation procedures and what to do if something happens in the station that would require them to exit.					
		Assure that the contract workers know location of nearest medical facilities and what to do if a medical emergency is encountered.					
NOTE: If mor	re than four	non-qualified persons are present, additional escor	rts are required.				
LOCATION:			DATE:				
DISTRICT EM	PLOYEE ESCO	DRT:					
VISITORS:							

ENCLOSED/CONFINED SPACE PROGRAM

Purpose

This program applies to all enclosed/confined spaces and provides requirements to protect employees from hazards when entering or working in these spaces. This program complies with WAC 296 45 and WAC 296-809.

Directions

Use the Confined Space Entry Permit (also available from the Safety website) for all permit entry confined spaces. Enclosed space access does not require the use of the Confined Space Entry Permit. Utilize the Enclosed Space Entry Procedures in lieu of using the permit.

Definitions

Enclosed Space: Spaces that may be entered by employees performing work on the District's URD vaults only. It does not apply to mechanically vented vaults if a determination is made the ventilation system is operating to protect employees before they enter the space. This paragraph applies to routine entry into enclosed spaces in lieu of the permit space entry requirements.

Confined Space: A confined space is defined as being:

- 1. Large enough and configured so that an employee may bodily enter
- 2. Having limited or restricted means for entry or exit (i.e. tanks, vessels, pits)
- 3. Not designed for continuous employee occupancy

If the space meets all the criteria above, it is a confined space.

Permit Entry Confined Space: A permit entry confined space is a confined space that also has one or more of the following hazards:

- 1. Contains or has a known potential to contain a hazardous atmosphere
- 2. Contains material that has the potential for engulfment of entrant(s)
- 3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section
- 4. Contains any other recognized serious safety or health hazard

If the confined space meets one of the four criteria above, it is a permit entry confined space.

Hot Work: The use of acetylene burning or welding equipment, electrical welding equipment, heating torches, any equipment involving open flames or operations such as riveting, chipping, or grinding that may produce a source of ignition while inside a confined space.

ENCLOSED / CONFINED SPACE

Procedures

Use the following procedures to determine the type of space and the applicable safe work practices.

Entry to Enclosed Spaces

- Monitor air prior to opening the cover or entering and while in the space.
- Use an attendant.
- Exit and reevaluate if the air monitor alarm sounds.

Entry to Confined Spaces

- Fill out the Confined Space Entry/Hot Work Permit.
- Monitor air prior to opening the cover or entering and while in the space.
- Use an attendant.
- Exit and reevaluate if the air monitor alarm sounds.

Entry to Permit Confined Spaces

- You must complete and all applicable sections, of the Confined Space Entry/Hot Work Permit form prior to entering the space and keep it at the entry to the permit confined space.
- You must review the following responsibilities and permit entry procedures for entry supervisor, entrant(s) and attendant(s) with affected employees prior to entering the permit entry confined space.

PERMIT SPACE ENTRY RESPONSIBILITIES

All entry supervisors, attendants and entrants must review these responsibilities.

Entry Supervisors' Responsibilities

The entry supervisor has overall responsibility for safe entry into the confined space. Each confined space project is to have a designated entry supervisor.

The entry supervisor must:

- Ensure the entry permit contains the necessary information before authorizing entry.
- Verify that only persons trained in confined space work enter the space.
- Verify attendants have current first-aid cards.
- Ensure where applicable, harnesses, lifelines, and a retrieval system are used.
- Ensure use of air monitoring equipment, communications, and outside attendants.
- Ensure air is monitored for oxygen content, flammable or combustible gases or vapors, and toxic gases or vapors.
- Ensure entrants and their representative(s) have an opportunity to review air monitoring and hazard controls.
- Ensure approved fall-protection equipment is used if a fall hazard of four (4) feet or more exists.
- Ensure special protective clothing (i.e. boots, gloves, pants, eye/face protection) is used where spaces contain hazardous chemicals or substances due to spills and/or leaks.

ENCLOSED / CONFINED SPACE

- Ensure the necessary procedures, practices, and equipment for safe entry are in effect before allowing entry.
- Ensure all entrances to a confined space are posted and entry is controlled by an attendant
- Ensure the space is returned to operational status when the work is complete.
- Identify fire hazards.
- Authorize hot work.
- Ensure fire protection for hot work.
- Ensure continuous ventilation during hot work.
- Ensure entry and hot work permits are saved for one year.
- If conditions change, reclassify confined spaces as permit-entry confined spaces.

Attendant Responsibilities

The attendant is the designated individual stationed outside the permit confined space who is trained as required and who monitors the authorized entrants inside the permit confined space. They control access into the space, continuously monitor atmospheric conditions, hazards and entrants. They have the authority to order all entrants out of the confined space if hazards are suspected.

The attendant must:

- Monitor only one confined space, (may do other tasks as long as they can monitor space and communicate with entrants).
- Control access into the confined space.
- Set up signs or guards around opening as needed.
- Track number and condition of entrants.
- Continuously monitor air monitoring and ventilating equipment.
- Monitor for hazards that may develop inside the confined space.
- Watch for hazards outside the confined space that may endanger entrants.
- Maintain communication with entrants.
- Set up and maintain rescue equipment.
- Monitor entrants for signs of hazards, (i.e. confusion, labored breathing).
- Summon emergency aid when necessary.
- Assist in entrant rescue without entering the confined space unless it is safe to do so.

Entrant Responsibilities

Entrants (the persons who enter the confined space) must:

- Understand specific entry requirements for the confined space being worked in.
- Recognize the presence of specific hazards that may be encountered in the confined space being worked in.

- Know how to use the safety and communication equipment being used in the confined space being worked in.
- Understand the rescue/evacuation procedures when an alarm is sounded or an attendant orders evacuation.

HOT WORK PERMITS

Hot Work Permits are to be initiated, completed, and signed by the entry supervisor and are issued only when the both of the following conditions have been met.

- 1. Continuous ventilation and/or appropriate respiratory equipment is provided where the nature of hot work creates a potential for a toxic or oxygen-deficient atmosphere.
- 2. Work that may create a fire hazard inside the space must be protected by appropriate fire extinguishing equipment. Consideration must be given to hazards that fire extinguishers may create inside a confined space such as oxygen deficiency from CO2 and toxicity from dry chemical.

PROGRAM ADMINISTRATION AND SUPPORT

A number of departments have specific responsibilities which must be met to assure an effective Enclosed/Confined Space Entry Program. Specific responsibilities are identified below.

Safety Department Responsibilities

The Safety Department Manager or their designee shall administer the program and shall be responsible for:

- 1. Developing, implementing, and maintaining the enclosed/confined space entry program.
- 2. Reviewing and interpreting state and federal regulations and industry guidelines.
- 3. Coordinating entry procedures among departments.
- 4. Working with operational and training departments to select enclosed/confined space equipment used for monitoring and rescue. Assist with training as needed.
- 5. Oversee the development of training.

Training shall consist of the following:

- Attendants' responsibilities.
- Entrants' responsibilities.
- Entry supervisors' responsibilities.
- Atmospheric testing, monitoring and related equipment.
- Use of forced air ventilation.
- Hazard identification and assessment.
- Emergency procedures.
- How to recognize signs, symptoms, and behavioral effects of hazard exposure.
- 6. Resolve complaints associated with enclosed/confined space entry.

ENCLOSED / CONFINED SPACE

- 7. Maintain records of employee training.
- 8. Coordinate periodic audits of the program's effectiveness.

Departments' Responsibilities

- Identify and categorize all Permit Required Confined Spaces under their control.
- Provide necessary entry and rescue equipment.
- Ensure employees are trained on work practices and entry and rescue equipment set up and use.

Engineering Departments

Will consider enclosed/confined space requirements when designing, specifying, or purchasing equipment or facilities considered enclosed/confined spaces so adequate methods for entry, rescue, ventilation, fall protection, etc., are addressed.

CONFINED SPACE ENTRY/HOT WORK PERMIT

Form continues across two pages. A one-page form is available to download from the Safety website.

Date:						
Site location or description:						
Purpose of entry:						
Supervisor(s):	Ту	/pe of cr	ew:	Phone #	£:	
Permit duration:						
Communication procedures (incluc	ling equip	oment):				
Rescue procedures						
REQUIREMENTS	DATE	TIME	REQUIREMENTS		DATE	TIME
Lockout/De-energize			Supplied Air Respirator			

ENCLOSED / CONFINED SPACE

Line(s) Broken-Capped	Respirator(s)
Purge-Flush and Vent	Protective Clothing
Ventilation	Full Body Harness w/ "D" ring
Secure Area (Post and Flag)	Emergency Escape Retrieval Equip
Lighting (Explosive Proof)	Lifelines
Hot Work Permit	Standby safety personnel
Fire Extinguishers (Dry/Co2)	Water Hose

AIR MONITORING						
Periodic atmosph	eric tests:					
Oxygen	% Ti	ime	Oxygen	C	% Time	
	% T	ime		C	% Time	
Explosive	% T	ime	Explosiv	e	% Time	
	% Ti	ime			% Time	
Toxic	% T	ime	Toxic		% Time	
	% Ti	ime		C	% Time	
Air Tester Name		Instrument(s) Used		Model #	Model # or Type	
				·		
Permit prepared by:						
	Entry Supervisor					
This permit is to be kept at the job site. Return this job site copy to the unit supervisor.						
Entrants Name			Sign In	Sign Out	Sign In	Sign Out

Department or phone number:

EMERGENCY CONTACT PHONE NUMBERS:

AMBULANCE: FIRE: SAFETY:

RESCUE TEAM:

PERSONAL PROTECTIVE GROUNDING

All rules included in WAC 296-45-345, Grounding, shall apply.

The **PRIMARY** function of personal protective grounds is to provide maximum safety for personnel while they are working on de-energized lines or equipment. This will be accomplished by making provisions, that will reduce the potential voltage differences at the worksite (voltage across the person) to a safe value in case the equipment or line being worked on is accidentally energized from any possible source.

The **SECONDARY** function is to protect against induced voltage from adjacent parallel energized lines.

The **THIRD** function is to make the protective devices (relays, circuit breakers or fuses) disconnect the energizing source within a given time/current relationship.

EQUIPOTENTIAL ZONE. Temporary protective grounds shall be placed at such locations and arranged in such a manner as to prevent each employee from being exposed to hazardous differences in the electrical potential.

GROUNDING EQUIPMENT

Grounding equipment shall be of approved current-carrying capacity capable of accommodating the maximum fault current to which the line or equipment could be subjected. Protective grounds shall only be used for grounding. Personal protective grounds will be tested annually.

Grounding jumpers shall have approved ferrules and grounding clamps that provide mechanical support for jumper cables independent of the electrical connection.

Protective grounds shall have an impedance low enough to cause immediate operation of protective devices in case of accidental energizing of the line or equipment.

PERSONAL PROTECTIVE GROUNDS USED AT THE DISTRICT

- 1) All 12kV distribution system circuits have low enough fault current to permit the use of a single set of #1/0 copper PPG.
- 2) At all District substations 115kV and on District 115kV transmission lines not connected to a BPA delivery point (see bullet #3), a single set of #2/0 copper PPG is sufficient.
- 3) The 115kV line emulating from BPA delivery points (BPA Murray, BPA Snohomish, BPA SnoKing) have a higher fault current and two #2/0 copper PPG in parallel are required to withstand that level of fault current when PPG are applied before the first substation. One set of #4/0 copper PPG is an acceptable alternative. Once a transmission line reaches the first District substation, a single set of #2/0 copper PPG is sufficient.
- Jackson Hydroelectric Plant has a high level of fault current on the 13.8kV bus, and a single set of #2/0 copper PPG would be required for either the 115kV bus or the 13.8kV bus.
- 5) One set of #2/0 copper PPG is adequate at North Mountain 230kV bus.

GROUNDING

- 6) On #2 or smaller size conductor distribution (12kV) lines, the qualified electrical employee may choose to apply a #2 copper PPG.
- 7) This procedure describes the minimum permissible PPG size, and a larger PPG is always acceptable.

Before grounds are installed, the de-energized line or equipment shall be tested for absence of voltage by the following approved method:

• Approved testers (audio and/or visual) are the preferred method of testing. However, they shall be tested immediately before and after use to verify the tester is in good working condition. Approved testers shall be used on transmission.

ATTACHING AND REMOVING GROUND(S)

Grounding equipment shall be given a visual inspection and all mechanical connections shall be checked for tightness before each use. Protective grounds shall only be used for grounding.

The surface to which the ground is attached shall be clean before the ground clamp is installed; otherwise, a self-cleaning clamp shall be used.

When attaching ground(s), the ground end shall be firmly attached first to a reliable ground with the other end attached to the line or equipment by means of an approved live line tool.

When a ground is removed, the grounding device shall be removed from the line or equipment using a live line tool before the ground end connection is removed.

Grounds may be temporarily removed, when necessary, for testing purposes. During a test procedure, the lead worker shall ensure each employee uses insulating equipment and is isolated from hazards and shall institute any additional measures necessary to protect each exposed employee until the grounds are reinstalled.

When the conductor separation at any pole or structure is so great as to make it impractical to apply shorts on all conductors, and where only one conductor is to be worked on, only the conductor to be worked on needs to be grounded.

In cases where ground rods or pole grounds are utilized for personal protective grounding, personnel working on the ground should maintain a sufficient distance from such equipment or utilize other approved procedures designed to prevent touch and step potential hazards.

Caution must be taken if the de-energized line to be worked on is parallel to an energized transmission line. Induced voltages and circulating currents may be substantial enough to cause injury or death.

PERSONAL PROTECTIVE GROUNDING OF OVERHEAD DISTRIBUTION LINES



STEP ACTION

- 1. Identify and isolate the line. Obtain visible openings on the source side (and the load side, if possible) of the line or equipment.
- 2. Call ECC for a clearance. (Follow clearance guidelines outlined in the District's *Switching and Clearance Procedures* manual.)
- 3. Use an approved voltage detector to test the line or equipment to ensure it is de-energized.
- 4. Make grounding connections in the following order:
 - Install a cluster bar on the pole just below the work area. Leave adequate working space above it.
 - Clamp one end of a 4 foot. jumper to the cluster bar, and the other end to the common neutral.
 - Jumper from the cluster bar to the closest phase conductor. Jumper the other phases together, working from the nearest to the farthest away.

5. Remove the grounds in the reverse order of installation.



Cluster Bar mounted below working position

GROUNDING

If there is a possibility a line worker may come into contact with **any** part of the structure (pole, cross arm, line hardware, grounding jumpers, etc.), personal protective grounds shall be installed. Line workers working out of an insulated platform are not exempt from this rule.



If it is preferred to use a set of bracket grounds, as shown above, Line workers shall install personal protective grounding on the structure they will be working on. Install a jumper from the cluster bar to the primary phase being worked. When work moves to another phase on the same pole, move the jumper to the new phase and begin work.

CAUTION: If the de-energized line to be worked is parallel to an energized HV transmission line, an induced voltage may be present. If the line worker uses a set of bracket grounds and a set of personal protective grounds, a circulating current may be present between the two sets of grounds.

The amount of induced voltage and circulating current depends on the voltage on the energized HV transmission line, how close the energized line is to the de-energized line, the distance the two lines parallel each other, and the distance between the two sets of grounds.

Always use an approved live line tool to install/remove all ground jumpers on the phase conductors to be grounded.



DANGER!

WHERE WORK ON DE-ENERGIZED AND GROUNDED LINES AND EQUIPMENT CANNOT BE DONE WITHIN THE EQUAL POTENTIAL ZONE, APPROVED RUBBER GLOVES SHALL BE WORN.

STEP ACTION

1. Identify and isolate the line. Obtain visible openings on the source side (and the load side if possible) of the line or equipment.

GROUNDING

- 2. Call ECC for a clearance. (Follow clearance guidelines outlined in the District's *Switching and Clearance* Procedures manual.)
- 3. Use an approved voltage detector to test the line or equipment to ensure it is de-energized.
- 4. Install personal protective grounds on both sides of the worksite at the nearest location where the primary and neutral conductors are in their normal positions, and where the grounds will not interfere with the work.

Note: Touch potential hazards refer to the difference in voltage measured between the grounding equipment and a worker in contact with the grounding equipment at the time it is accidentally energized. Step potential hazards refers to the difference in voltage measured between the feet of the worker standing or walking in an electrical field created by high voltage being brought to earth.

ADDITIONAL REQUIREMENTS FOR UNDERGROUND

Before cutting into a high-voltage cable or opening a high-voltage splice, the cable shall be deenergized, and a clearance obtained, tagged, tested with an approved testing device and then grounded in an approved manner. If, in areas where a high voltage cable or splice is to be cut and the ground cannot visibly be seen, the high voltage cable or splice shall be identified, tested, and spiked before work is performed.

A capacitance charge can remain in high-voltage cables after it has been disconnected from the circuit and a static-type arc can occur when grounds are applied to such cables.

When work is to be done on cables or equipment in a high voltage underground system, precautions to prevent backfeed shall be taken. This shall include either isolating or grounding the secondary conductors.

When work is performed on a cable at a location remote from the cable terminal, the cable may not be grounded at the cable terminal if there is a possibility of hazardous transfer of potential should a fault occur. If the cable(s) cannot be isolated and are grounded at a remote location from the work area, an equal potential grounding blanket must be used to protect the employee performing the work.

For more detailed information for grounding on different types of underground equipment see *T&D Guidelines*, *4*-20-5.0.

SUBSTATION

Grounds applied at North Mountain Substation shall be of flexible 2/0 copper cable or equivalent. One sets of grounds will be used on the 230kV side of the transformer and equivalent buss work.

VEHICLE GROUNDING

All lifting equipment shall be bonded to an effective ground or barricaded and worked as energized when utilized on or near energized conductors.

GROUNDING

- 1. Trucks must have the dielectric certification tag near the lower control station. Bucket trucks will be tested annually and a new tag installed each year.
- 2. Prior to the first use of the boom each day and, any time the boom has gotten dirty, the upper and lower insulated section of the boom must be cleaned using only the boom cleaning material provided for this purpose. This is included on the preflight visual inspection checklist.
- 3. For added protection, employees working on the ground shall not touch the truck when standing on the ground or getting on/off the truck when it is being used around energized lines or equipment. Employee(s) on the ground must communicate to the employees in the bucket when they need to get on/off the truck. The bucket shall not be moved during the time. This must be reviewed during the job briefing.
- 4. All other equipment that doesn't meet these requirements must be grounded and barricaded as required in the *Accident Prevention Manual*, page Q-4.

All truck ground leads shall be inspected before use to ensure no damage has occurred to the ground lead or the clamps. Each clamp shall be inspected to assure tight connections at the clamp.

The point of the vehicle to which the ground cable is attached should be thoroughly cleaned and free of paint, rust, oxides, or any other material that might tend to offer resistance to the flow of ground current.

All conductors, busses, ground mats, etc., shall be cleaned before attaching ground leads to assure a solid connection.

It is recommended that the excess ground cable be uncoiled from the truck when in use and placed in an area where it will not pose an additional hazard.

Truck grounds shall be a minimum of 1/0 flexible copper or its equivalent and shall be secured to permanently grounded and clean objects in the following order or preference:

- 1) Station Ground Mat
- 2) Neutral, System of #4 copper or greater
- 3) Steel Tower
- 4) Driven Ground Rod. ONLY IF THE ABOVE ARE NOT AVAILABLE.

MECHANICAL EQUIPMENT, INCLUDING AERIAL MANLIFT EQUIPMENT - WAC 296-45-375

A daily visual inspection and operating tests shall be made in accordance with the manufacturer's recommendation by the assigned operator.

Aerial lift equipment shall be of the type designed and maintained to meet the following safety factors:

- 1. Stability test. All such equipment shall meet or exceed a safety factor of one and one-half (1-1/2) to one -(1) in all working positions, based upon the posted working load.
- 2. Structural and mechanical tests. All such equipment shall meet or exceed a safety factor of two (2) to one (1) in all working positions, based upon the manufacturer's maximum rated capacity.

The Department of Labor and Industries will accept, in lieu of section two (2) of this section, the safety factor test data submitted by the manufacturer by a competent testing laboratory, or by a registered engineering firm. When, and if, there exists a reasonable doubt as to whether or not the equipment will meet the data required for stability in structural and mechanical tests, the department may require testing be performed on such equipment before it can be used. If the department, in writing, requires that the District test its equipment or have such equipment tested, the District will have a reasonable time within which to secure such information as is required by this rule.

Employees shall not move any such equipment in the direction of an obstructed view. (An obstructed view exists even though the operator is able to see to the rear by reason of a system of mirrors or a mirror.)

Vehicles can be backed up only when an observer signals that it is safe to do so or the driver makes a walk-around inspection prior to backing up, or the vehicle has a reverse signal alarm audible above the surrounding noise level.

Any type of equipment utilizing booms or ladders to raise baskets or platforms in or from which employees work, will be classified as aerial lift equipment. For purposes of this section, the device used to elevate employees will be termed "boom," the portion upon which the employee stands will be termed "basket."

Only personnel authorized by the Transportation department are permitted to perform mechanical maintenance or repair work on aerial equipment.

Only authorized persons who are properly trained and qualified shall use or operate this equipment.

The operating and maintenance instruction manuals issued by the manufacturer shall be followed.

Load limits of the boom and basket shall not be exceeded. Shock loading (sudden stops or starts) of the equipment shall be avoided.

Aerial lifts shall not be field modified unless such modification is certified by the manufacturer and approved by the District's Transportation and Safety departments.

The critical safety components of mechanical elevating and rotating equipment shall receive a thorough visual inspection and operational test before use on each shift. (See *Daily Pre-Flight Visual Inspection*.)

Note: Critical safety components of mechanical elevating and rotating equipment are components whose failure would result in a free fall or free rotation of the boom.

No vehicular equipment having an obstructed view to the rear may be operated on off-highway job sites where any employee is exposed to the hazards created by the moving vehicle, unless:

- 1. The vehicle has a reverse signal alarm audible above the surrounding noise level; or
- 2. The vehicle is backed up only when a designated employee signals that it is safe to do so.

The operator of an electric line truck may not leave his/her position at the controls while a load is suspended, unless the District can demonstrate that no employee (including the operator) might be endangered.

Rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler-type tractors, crawler-type loaders, and motor graders, with or without attachments, shall have rollover protective structures that meet the requirements of chapter 296-155 WAC, Part V.

OUTRIGGERS

Vehicular equipment, if provided with outriggers, shall be operated with the outriggers extended and firmly set as necessary for the stability of the specific configuration of the equipment. Outriggers may not be extended or retracted outside of clear view of the operator unless all employees are outside the range of possible equipment motion.

If the work area or terrain precludes the use of outriggers, the equipment may be operated only within its maximum load ratings for the particular configuration of the equipment without outriggers.

Applied loads. Mechanical equipment used to lift or move lines or other material shall be used within its maximum load rating and other design limitations for the conditions under which the work is being performed.

Hydraulic fluids. All hydraulic fluids used for the insulated section of derrick trucks, aerial lifts, and hydraulic tools, which are used on or around energized lines or equipment shall be of the insulating type.

Mechanical adjustment or repairs shall not be attempted or performed in the field except by a person qualified to perform such work.

Malfunction or needed repairs of manlift equipment shall be reported to the employee responsible for such repairs as soon as reasonably possible. Use of equipment that is known to be in need of repairs or is malfunctioning is prohibited when such deficiency creates an unsafe operating condition.

When any aerial manlift equipment is parked for operation at the job site, the brakes shall be set. Wheel chocks shall be used to prevent accidental movement while parked on an incline.

Employees shall not sit or stand on the basket edge, stand on materials placed in or across the basket, or work from a ladder set inside the basket.

The basket shall not be rested on a fixed object(s) so that the weight of the boom is either totally or partially supported by the basket.

While performing construction work, only state-certified crane operators shall operate cranes with a lifting capacity of more than two (2) tons with the exception of an electrical-rated crane with a fiberglass boom section. State certification is not required when operating a crane to perform maintenance work. In all cases, the operator must have the necessary training to safely operate the crane. (Please see Section J, *Cranes, and Derricks, Hoisting Equipment*, for more information.)

OPERATIONS NEAR ENERGIZED LINES OR EQUIPMENT

Mechanical equipment shall be operated so that the minimum approach distances of Table 2, WAC-296-45-325, are maintained from exposed energized lines and equipment. However, the insulated upper portion excluding the basket/bucket of an aerial lift operated by a qualified electrical employee in the lift is exempt from this requirement.

A designated employee other than the equipment operator shall observe the approach distance to exposed lines and equipment and give timely warnings before the minimum approach distance required by subsection 296-45-375 (10)(b), unless the lead worker can demonstrate that the operator can accurately determine that the minimum approach distance is being maintained.

If; during operation of the mechanical equipment, the equipment could become energized, the operation shall also comply with at least one of the following:

- 1. The energized lines exposed to contact shall be covered with insulating protective material that will withstand the type of contact that might be made during the operation or,
- 2. The equipment shall be insulated for the voltage involved. The equipment shall be positioned so that uninsulated portions cannot approach the lines or equipment any closer than the minimum approach distances specified in Table 2 located in WAC 296-45-325 or,
- 3. Each employee shall be protected from hazards that might arise from equipment contact with the energized lines. The measures used shall ensure that employees will not be exposed to hazardous differences in potential. Unless the District can demonstrate that the methods in use protect each employee from the hazards that might arise if the equipment contacts the energized line, the measures used shall include **ALL** of the following techniques:
 - Using the best available ground to minimize the time the lines remain energized; See *Vehicle Grounding*, P-13.
 - Bonding mechanical equipment together to minimize potential differences;
 - Providing ground mats to extend areas of equipotential; and

• Employing insulating protective equipment or barricades to guard against any remaining hazardous potential differences.

While working in aerial equipment, employees shall wear a full body harness and a lanyard attached to the boom or basket, in a secure manner.

No component of aerial devices shall be operated from the ground without permission from the employee in the basket except in case of emergency.

Operating levers or controls shall be kept clear of tools, materials or obstructions.

Employees shall not climb into or out of the basket or platform while it is elevated or change from one basket to another on dual basket equipment, except in case of emergency or when the employees involved agree that this is the safest way to perform the work. This exception shall not be used to circumvent safety rules.

The truck shall not be moved unless the boom is lowered, the basket cradled and secured, and the outriggers fully retracted.

Employees shall not ride in the basket when moving the equipment. **Exceptions:** employees may ride in the basket for short moves at the work location if the basket is returned to the cradled position, the outriggers fully retracted for each move, and the employees face the direction of travel.

Existing safety rules governing the use of hot line tools, rubber and other protective equipment and safe work practices while performing work from poles or structures shall also apply to work done from aerial manlift equipment.

The basket shall be kept clean and all tools not in use shall be secured or removed.

An approved warning light shall be operating when the boom leaves the cradle. This light shall be visible to approaching traffic when the boom is in position over any traveled area.

All aerial manlift equipment shall have both upper and lower controls (except ladder trucks need not have upper controls). The upper controls shall not be capable of rendering the lower controls inoperative. The lower controls should be located at or near the base of the aerial structure. If the lower controls are used, the operator shall have a view of the elevated employee(s) or there shall be communication between the operator and the employee in the elevated aerial structure. No employee shall be raised, lowered, or moved into or from the elevated position in any aerial manlift equipment unless there is another employee, not in the elevated aerial structure, available at the site to operate the lower controls, except as follows:

- Where there is a fixed method permanently attached to or part of the equipment that will permit an employee to descend from the elevated position without lowering the elevated structure; or
- Where there is a system that will provide operation from the elevated position in the event of failure or malfunction of the primary system.

Controls in aerial manlift equipment shall be protected from accidental operation. Controls of the outriggers shall also be protected from accidental operation. Such protection may be by guarding or equivalent means.

The manufacturer's recommended maximum load limit shall be posted at a conspicuous place near each set of controls and kept in legible condition.

PRE-FLIGHT

The manufacturer's operator's instructional manual shall be kept in the vehicle.

Operating instructions, proper sequence and maintenance procedures prescribed by the manufacturer shall be followed. A daily preflight visual inspection must be completed and logged in the provided log book for each truck.

This daily inspection is intended to assist the crews in complying with the applicable OSHA requirements found in the federal register.

Section 1926.556 Aerial Lifts. Extendible and articulating boom platforms.

(i) Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.

Section 1926.952 Mechanical Equipment.

Tests shall be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition.

Procedure for the use of the upper insulated section of personnel lift equipment while working around energized distribution lines or equipment without truck grounds and barricades:

- 1. Truck must have the dielectric certification tag near the lower control station. The bucket trucks will be tested on an annual basis and a new tag installed each year.
- 2. Prior to the first use of the boom each day and any time the boom has gotten dirty, the upper and lower insulated section of the boom must be cleaned using only the provided boom cleaning material. This is included in the daily pre-flight visual inspection checklist.
- 3. For added protection, employees working on the ground shall not touch the truck when standing on the ground or getting on/off the truck when it is being used around energized lines or equipment. Employee(s) on the ground must communicate to the employees in the bucket when they need to get on/off the truck. The bucket shall not be moved during this time. This must be reviewed during the job briefing.
- 4. All other equipment that doesn't meet these requirements must be grounded and barricaded as required in the *Accident Prevention Manual* page Q-2.

To ensure the safety of employees, this procedure must be strictly adhered to.

LADDERS

LADDER SAFETY

WAC 296-876

For fall protection requirements, see *Fall Arrest/Fall Restraint* Section.

All ladders must be inspected prior to use. If any defects are found, the ladder shall not be used and must be immediately turned in for repair or replacement.

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

Care shall be used in placing ladders. The bottom of the ladder should be away from the wall a distance equal to one fourth the length of the ladder from the ground to the point of support.

The work area around the top and bottom of the ladder shall be kept clear.

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

The employee shall face the ladder and use both hands when ascending and descending. Materials and tools shall be raised and lowered by a hand line.

The side rails of the ladder must extend at least three (3) feet above the roof, platform, upper landing, and equipment, etc., unless handholds are provided.

Ladders shall be used only for the purpose for which they were designed. The top two (2) steps or the top step of a step ladder shall not be used as a step.

When working from a step ladder over five (5) feet high, employees shall not stand on a step higher than the third step from the top of the step ladder.

When working on a straight ladder that does not extend above the top of a building, platform, etc., employees shall not stand on a step higher than the third step from the top of the ladder.

Step ladders shall not be used as single ladders.

Adjustments of extension ladders should only be made by the user when standing at the base of the ladder so that the user may observe when the locks are properly engaged. Adjustment of extension ladders from the top of the ladder (or any level over the locking device) is a dangerous practice and should not be attempted. Adjustments should not be made while the user is on the ladder.

Ladders shall be inspected prior to each use and those which have developed defects shall be withdrawn from service for repair by the Maintenance Department. They shall be tagged or marked as "Dangerous, Do Not Use."

Rungs should be kept free of grease and oil.

LADDERS

Ladders shall not be placed on boxes, barrels or other unstable bases to gain additional height.

Ladders shall not be used in aerial lift baskets to gain additional height.

Ladders shall not be used as guys, braces, skids or for other than their intended use and purposes.

Portable ladders (except step ladders) will be equipped with non-slip bases.

Wooden ladders shall not be painted, as it might obscure a defect in the wood. Only clear, nonconductive finishes shall be used.

Only approved portable wood or approved fiberglass ladders shall be used in the vicinity of exposed electrical circuits.

Only one (1) employee shall work from a ladder at one time, except for hook type ladders. If two (2) employees are required, a second ladder shall be used.

Only District-provided ladders shall be used by employees.

Employees shall belt off to a ladder or other secure point whenever both hands must be used for the job or there exists a possibility of the employee falling from an elevated position.

Any work that requires wearing eye protection, respirators or handling of pressure equipment shall not be performed from a ladder more than ten (10) feet above the surrounding surface.

Ladders shall not be spliced together to form a longer ladder.

A ladder shall not be placed against an unsafe support.

Ladders shall be sufficiently strong enough for the intended use.

Boxes, chairs, cartons, etc., shall not be used as ladders.

FIXED LADDERS

WAC 296-876-60065 Protective Structures and Equipment

You must make sure a cage, well, or ladder safety system is provided if:

- 1. The length of climb is less than twenty-four (24) feet; and
- 2. The top of the ladder is more than twenty-four (24) feet above the ground, floor, or roof.

You must make sure a ladder with a single length of climb that is equal to or greater than twenty-four (24) feet is either:

- 1. Equipped with a ladder safety device; or
- 2. Uses multiple ladder sections and meets all the following:
 - a. Each section is provided with a cage or well.
 - b. The length of climb of any ladder section is not greater than fifty (50) feet.
 - c. Each ladder section is offset from adjacent sections.
 - d. Landing platforms are provided at maximum intervals of fifty (50) feet.

EYE PROTECTION

EYE AND FACE PROTECTION

Affected employees shall use eye protection that provides side protection when in the vicinity of any substance, flying particles, electrical hazards or chemicals that may cause injury to a person's eyes.

Employees shall be provided with and wear eye and face protection when working on or around operations that present potential eye or face injury from physical or chemical-related work.

Employees whose vision requires the use of corrective lenses in spectacles shall be protected by goggles or their own corrective safety glasses, meeting the requirements of ANSI Z87.1. The Safety department reimburses employees for a portion of the spectacles cost for those whose job exposes them to hazards.

Face and eye protection equipment shall be kept clean and in good repair. The use of equipment with structural or optical defects shall be prohibited. All eye and face protection shall be distinctly marked to facilitate identification of the manufacturer.

Safety glasses in various styles and tints are stock coded and available in the District's Warehouses.

Employees shall use eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.

Employees whose vision requires the use of corrective lenses in spectacles, when required by this regulation to wear eye protection, shall be protected by goggles or spectacles of one of the following types:

- 1. Spectacles whose protective lenses provide optical correction.
- 2. Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.
- 3. Goggles that incorporate corrective lenses mounted behind the protective lenses.

Face and eye protection equipment shall be kept clean and in good repair. The use of this type of equipment with structural or optical defects shall be prohibited.

Accidents to the eye can be classified into one of the following groups:

- 1. Impact.
- 2. Chemical splash.
- 3. Dust.
- 4. Light rays and glare.

Appropriate and approved eye/face protection shall be worn when an employee is engaged in the following work activities:

- 1. Drilling or chipping stone, brick, concrete, paint, pipe coatings or metal;
- 2. Power grinding, buffing, or wire brushing;

- 3. Flame welding, cutting or burning; (Approved colored lenses shall be used.)
- 4. Hand drilling or sawing of overhead objects;
- 5. Use of powered tools such as drills, saws or sanders;
- 6. Dust or flying particles (compressed air used for cleaning purposes must be less than thirty (30) psi), and then effective chip⁻ guarding and personal protection must be used;
- 7. Handling acids, caustics, chlorine, ammonia or other similar liquids or gases, except when approved, complete head coverings are worn (chemical goggles are necessary.)
- 8. Brush chippers, powered trimming equipment, mowers, weed-eaters, etc;
- 9. Any time there is a possibility of electrical flash safety glasses shall be worn. This includes opening and closing of circuits;
- 10. While using powder-actuated tools.

Potential Hazards from Impact:

Flying objects are possibly the greatest danger to the eye. Chips from the chipper hammer or the metal working tool, the waste particles from grinding or woodworking, a broken tool or grinding wheel or an improperly driven nail are all dangers that our eyes must be protected against.

Potential Hazards from Chemical Splash:

Protection is needed that absolutely seals the eye against any possible entry.

A plastic flexible frame goggle is excellent protection against less hazardous chemicals and acids. For more severe conditions, flexible vinyl jumbo plate goggles with splash proof indirect ventilators or face shields should be worn.

Potential Hazards from Dust:

Where extreme dust hazards exist, plastic frame flexible goggles are more desirable.

Potential Hazards from Light Ray and Glare:

The light ray from welding and cutting operations can be highly injurious to unprotected eyes. Heat treating, metal pouring, steel and glass furnaces and laser beams are other sources of glare.

In gas welding, cup-type welding goggles with green filter lenses are most commonly used.

For electric welding, helmets are necessary to protect the head and eyes from infrared and ultraviolet radiation burns, hot metal, chips and flying sparks.

TRENCHING, SHORING AND EXCAVATION

THE DISTRICT CLASSIFIES ALL SOILS AS CLASS "C" EXCEPT SOLID ROCK.

WAC 2960-155-650

This section is intended to provide for the protection of all employees during any trenching, shoring and excavation work in connection with construction work relating to vault excavations, underpinning, shoring or bracing. All phases of trenching, shoring and excavation work shall be observed at all times in accordance with these rules.

Before opening an excavation or trench, underground utilities such as sewer, telephone, fuel, electric, water, or other installations will be located. The appropriate utility company shall be notified and requested to identify the exact location of the underground installation.

- 1. Proper supports and precautions shall be provided for existing utility installations.
- 2. When electric lines are of the direct burial type, a qualified electrical employee shall make positive identification of the cable.
- 3. Mechanical excavating equipment shall maintain a two (2) foot clearance from the direct burial cable.

All employees shall be protected with personal protective equipment for the protection of the head, eyes, respiratory organs, hands, feet, and other parts of the body where there is an exposure to hazardous conditions. In locations where oxygen deficiency or gaseous conditions are possible, review the *Enclosed Space Entry* section of this manual.

No personnel shall be permitted under loads handled by power shovels, derricks, or hoists. To avoid any injury from spillage employees (including the driver, unless they are protected adequately by the cab) shall be required to stand away from any vehicle being loaded.

Protection systems for use in excavations more than twenty (20) feet in depth shall be designed by a registered professional engineer.

Trench and Excavation Protection

Except in solid rock, the sides of trenches and excavations, including embankments, four (4) feet or more in depth shall be shored, sheeted, braced, sloped or supported by a means of sufficient strength to protect employees.

Protection for Trenches Less than Four (4) Feet

Trenches less than four (4) feet in depth shall be effectively protected when there are indications that hazardous ground movement is possible.

Storage of Excavated Material

- 1. In excavations or trenches that employees are required to enter, excavated or other material shall be stored and retained at least two (2) feet away from the edge of the excavation or trench.
- 2. Barriers or other effective retaining devices may be used to prevent excavated or other material from falling or rolling into the excavation or trench.

Excavation and Trench Exits

When employees are required to be in excavations or trenches four (4) feet deep or more, an adequate means of exit, such as a ladder or steps, shall be provided and located within twenty-five (25) feet of lateral travel. An earth ramp is acceptable, providing all the following requirements are met:

- 1. The stability of the earth is adequate for good footing and,
- 2. The total travel distance does not exceed twenty-five (25) feet and,
- 3. Adequate shoring or equivalent protection is provided for the entire escape route.

When sloping does not extend to the bottom of the trench, shoring shall be required to support the vertical part of the trench. The shoring shall extend above the bottom of the slope a minimum of eighteen (18) inches to prevent material from sliding or rolling into the trench.

Surface Encumbrances

Trees, boulders, utility poles, and other surface encumbrances, located to create a hazard to employees involved in an excavation or trenching work shall be removed or made safe before excavation or trenching is begun or continued.

Excavations shall be sloped at an angle not steeper than one and one half (1-1/2) to one (1) vertical $(34^{\circ}$ measured from the horizontal) or, determine the maximum slopes and configurations using soil testing and classifications. Designs of sloping or benching systems shall be selected from tabulated data such as tables and charts.

Sloping and benching systems not utilizing any of the above options shall and must be approved by a registered professional engineer.

Employees shall not work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazards of falling, rolling or sliding material or equipment.

Shoring systems shall not be subjected to loads exceeding those which the system was designed to withstand.

Employees shall be protected against cave- ins when entering or exiting the areas protected by the shoring.

Employees shall not be in trenching devices while they are being installed, removed, or raised vertically.

Employees exposed to vehicular traffic shall wear high-visibility garments of retroreflective material (ANSI/ISEA 107-2015).

Soil classifications shall be classified by a competent person. Soil analysis shall be at least a visual test. Soil classifications at the District shall be class C, except solid rock.

Plywood shall be used only to prevent local raveling (sloughing of the trench face) between shores. Plywood shall be one and one-eighth (1-1/8)" thick softwood or three-quarter (3/4)" #14 ply arctic white birch (Finland form).

Plywood shall not be used as a structural member of a shoring system.

When vertical aluminum shoring is used, there must be a minimum of three (3) shores equally spaced horizontally, in a group.

When surcharge loads (depending on road vibrations, wet soils, etc., equipment, spoil piles, areas surrounding the exposed areas of an open trench) are in excess of the two (2) foot spoil pile surcharge, or in excess of 20,000 pounds, the competent person shall determine the degree to which the actual slope must be reduced or the size of the members of the protective system must be increased.

Installation and Removal of Support

- 1. Members of support systems shall be securely connected to prevent sliding, falling, kick outs, or other predictable failure.
- 2. Support systems shall be installed and removed in a way that protects employees from cave-ins, structural collapses or from other members of the support system.
- 3. Individual members of support systems shall not be subjected to loads exceeding their design.
- 4. Before removal of individual members begins, additional precautions shall be taken to ensure the safety of employees installing other structural members to carry the loads imposed in the support system may be required.
- 5. Removal shall begin at the bottom of the excavation. Members shall be released slowly, noting any indication of possible failure of the remaining members or possible cave-in.
- 6. Backfilling shall progress, together with the removal of support systems from excavations.

Physical Barrier Protection

- 1. Adequate physical barrier protection shall be provided at all remotely located excavations or trenches.
- 2. All wells, pits, shafts, etc., shall be barricaded or covered.

Upon completion of exploration and similar operations, temporary wells, pits, shafts, shall be completely backfilled.

Inspections

- 1. Daily inspections of excavations, adjacent areas, and protective systems shall be made by the competent person for any situations that could result in cave-ins, failure of protective systems, or other hazardous conditions. An inspection shall be conducted by the competent person before the start of work and, as needed, throughout the shift. Inspections shall be made after every rainstorm or other potential hazard increasing occurrence.
- 2. Where the competent person finds evidence of a situation that could result in a possible cave-in, failure of the protective system, or other hazardous conditions, exposed employees shall be removed from the area until the necessary precautions have been taken.

Manufactured materials and equipment used for protective systems shall be used and maintained consistent with the manufacturer's recommendations.

Stability of Adjacent Structures

- 1. Where the stability of adjoining buildings, walls or other structures is endangered by excavation operations, support systems shall be provided to ensure their stability.
- 2. Excavation below the level of the bases or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted unless:
 - a) A support system is provided to ensure the safety of employees and the stability of the structure or, the excavation is in stable rock or,
 - b) A registered professional engineer has determined the structure is sufficiently removed from the excavation and unaffected by the excavation or,
 - c) A registered professional engineer has determined such excavation work will not pose a hazard to employees.
- 3. Sidewalks, pavements, and other structures shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse.

When excavation operations approach the location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

While the excavation is open, underground installations shall be protected, supported or removed, as necessary, to safeguard employees.

Water Main Safeguards

When existing loop water mains are running laterally within two (2) feet of the excavation or trench wall, the water valve the greatest distance from the work site shall be closed.

- 1. The exact location of the open valve and the valve key shall be given to the workers before they enter the excavation or trenches.
- 2. The open valve location shall be marked and clear access to the valve maintained.

PROTECTION FROM HAZARDS ASSOCIATED WITH WATER ACCUMULATION

Employees shall not work in excavations when water is accumulating unless adequate precautions have been taken to protect employees against water accumulation hazards. Precautions necessary to protect employees adequately vary with each situation, but could include special support, shoring systems to protect from cave-ins, or water removal to control the water levels.

Surface Water Control

Diversion ditches, dikes, adequate drainage, or other suitable means shall be used next to the excavation or trench to prevent surface water from entering.

Ramps and Runways

- 1. Ramps or runways used for vehicles shall be of a width of not less than four (4) feet wider than the vehicle used and shall be provided with:
 - a) Timber guards no less than eight (8) inches placed parallel to and secured to the sides of the runway or ramp or,
 - b) Berms on earthen ramps or,
 - c) Other equivalent protection.
- 2. All ramps and runways shall receive daily inspection, and shall be maintained in a safe and serviceable condition.
- 3. Workers shall stay off ramps and runways when vehicles are passing over them.
- 4. All ruts and holes shall be filled in, humps leveled off and the runway or ramp made smooth.

Walkway and Bridge Requirements

Where employees or equipment cross over excavations or trenches, walkways or bridges with standard guardrails shall be provided. Such walkways or bridges shall be designed and constructed by competent persons according to accepted engineering requirements and practices.

Employees next to excavations, and not directly involved in the excavation work, shall be protected by standard guardrails or equivalent means to prevent their falling.

Top Person

No person shall be allowed to work in a trench over four (4) feet in depth unless there is a top person in constant attendance. The top person shall be in addition to the equipment operator when the person in the trench is not in constant view of the equipment operator.

Signal Persons

Signal persons shall be used to direct equipment when backfilling when the operator does not have a clear view of the excavation.
Warning System for Mobile Equipment

When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, you must utilize a warning system such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

Dust conditions

Dust conditions shall be minimized by using water or other effective means.

Purpose

Accident reporting is an essential element of any accident prevention program. For reporting purposes, an accident is defined as any unplanned event that may result in personal injury/illness/cumulative trauma or property damage. Since every accident includes a sequence of contributing causes, it is possible to avoid a recurrence by recognizing and eliminating these causes. The removal of just a single factor from the sequence of events can prevent a recurrence.

All minor injuries shall be properly treated. When professional medical services are necessary and the employee is taken from the work site, the Energy Control Center (x 5040) must be notified to start the reporting procedure process.

PROCEDURES FOR CALLING 911

Any employee who witnesses an injury or onset of an illness or medical condition of a fellow employee where it appears the employee may need medical assistance should call 911. It's not uncommon for an injured or ill employee to say no when asked if he/she needs help, even if they do. Many times the person wants to go on his/her own or have a co-worker take him/her to a medical facility. This can result in serious to life threatening complications if the employee develops problems while in transport. Although an employee has the right to decline medical treatment under state law, we first need the emergency responders to determine if it is safe for someone other than emergency personnel to transport the employee.

There are many situations where 911 should be called, but in any of the following work-related situations 911 must be called:

- An electrical primary contact.
- A significant electrical secondary contact where the employee is not able to free him/herself from the contact.
- A fall from a height of ten (10) feet or greater. Falls from less than ten (10) feet can also require medical attention requiring a 911 call.
- An impact injury that may cause damage to internal organs.

As soon as possible, notify the Energy Control Center (x 5040) and the employee's supervisor when an employee sustains an injury or experiences the onset of an illness or medical condition that may require medical attention.

ACCIDENT REPORTING

All accidents, no matter how minor, shall be reported promptly to your immediate lead worker/supervisor. To report an occupational personal injury/illness/cumulative trauma or vehicle accident/property damage, an employee has the option of first completing the Employee Preliminary Report of Accident (Form 1379A) and his/her lead worker/supervisor must then complete the Supervisor Report of Accident (Form 1379). If the employee chooses not to fill out Form 1379A, then he/she must

work with his/her lead worker/supervisor to complete the Supervisor Report of Accident (Form 1379). Instructions for completing Form 1379 are attached to the back of the form.

REPORTABLE VEHICLE ACCIDENT / REPORTABLE MOTOR VEHICLE INCIDENT

All employee motor vehicle accidents that occur while the employee is working and involve injury or damage to property not belonging to the District shall be immediately reported to the Energy Control Center (x 5040) and your supervisor. All other minor vehicle accidents not requiring towing shall be reported as soon as possible to the employee's supervisor. This includes an employee using their personal vehicle for work-related transportation.

For accidents involving District motor vehicles, along with the Preliminary Report of Accident (1379A) and the Supervisor Report of Accident (form 1379) employees must complete the Preliminary Vehicle Accident Report (form 1475) found in the glove box of District vehicles.

Employees shall not discuss or argue the cause or results of the incident but shall secure all pertinent facts and information including the name, address and insurance company of those involved, as well as any witnesses.

Should the other driver demand immediate action, referral shall be made to the employee's supervisor.

Every driver involved in an accident is legally required to remain at the scene of the accident, render aid and give pertinent information to others involved and the appropriate law enforcement agency. (See *Section B: Automotive Safety.*)

NEAR MISS/SAFETY LEARNING OPPORTUNITY REPORTING

The District's Near Miss/Safety Learning Opportunity form (page U-11) is to be used for reporting near misses that could have resulted in an injury or property damage. There is also a telephone reporting number (425-783-4441).

SAFETY SUGGESTION & CONCERN FORM

The District's Safety Suggestion & Concern form is to be used for reporting a safety concern in an area that you are unsure to whom it needs to be reported. This form may also be used to make a safety suggestion. These forms may be found by Safety Bulletin Boards throughout the District. There is also a form available on the Snoweb Safety site

INDUSTRIAL

An employee who is injured while in the course of his/her employment at the District is entitled to be covered under worker's compensation. Questions regarding this can be addressed through Employee Resources (425-783-8556).

SUPERVISOR/LEAD WORKER ACCIDENT REPORTING RESPONSIBILITIES

Begin the accident investigation promptly; Safety and/or Risk Management may assist. Depending on the severity of the accident, the State Safety Inspector and Union Accident Representative may be present at the accident site.

Call the Safety department as soon as possible if the injured worker has been removed from the work site and taken for medical treatment. The Safety department will report to the medical facility to assist the injured employee.

If the employee has not filled out the Employee Preliminary Report of Accident (Form 1379A), complete the Supervisor Report of Accident (Form 1379) with the injured worker. (If necessary, call the employee at home to get basic information.) A separate sheet of paper may be necessary. If an investigation is in progress, please indicate so on the form. The accident report form is available on-line at the Safety department website.

Implement appropriate preventative measures. Follow up on recommendations requiring upper management approval and/or a Facilities request for services or modification of equipment.

Forward a copy to the Safety department within five (5) working days. When the report is complete, route for appropriate approval signatures.

GUIDELINES FOR ACCIDENT INVESTIGATION

The Purpose of an Accident Investigation

Describe What Happened:

Thorough investigations can sometimes sift through conflicting evidence to arrive at an accurate statement of what really happened.

Describe Immediate Causes:

Immediate causes are usually easy to identify when conducting an accident review. They are the obvious unsafe actions and/or unsafe conditions that contributed to the accident.

Determine the Root Causes:

If there are no root causes identified, there is little or no return on the investment of the time spent investigating an accident.

Root causes are harder to determine without asking the question "Why?" Why did the unsafe act and/or condition occur? They involve personal and job factors. When root causes are overlooked, the chance of preventing recurrence is reduced.

Personal Factors

Job Factors

- Physical factors Knowledge/training Stress Motivation Fatigue Wear and tear Skill
- Supervision/leadership Engineering Purchasing Maintenance Tools/equipment Work standards

Decide the Risks

Good investigations provide the basis for deciding the likelihood of reoccurrence and the potential for major loss — two critical factors in determining the amount of time and money spent on corrective items.

Develop Controls

Adequate controls to minimize or eliminate a problem can only come from a sound investigation which has truly solved a problem.

Define Trends

Few accidents and incidents are truly isolated events. When a significant number of good reports are analyzed, emerging trends may be identified.

Demonstrate Concern

Accidents give people vivid pictures of threats to their health and well-being. It is reassuring to see a prompt, objective investigation in progress.

SUPERVISOR REPORT OF ACCIDENT (FORM 1379) – FRONT

		SUPE	RVISOR RE	PORT OF AC	CIDENT	Safety Log No.:
1379 - Rev. 0	2/07					Preventable? _ Yes _ No
SECTION 1: BE	FORE STARTIN	IG REPORT RE	FER TO BACK	OF THIS FORM T	O DETERMINE SEVER	RITY
Accident Date:	Hour of Day	Name of En	nployee:	Occupation:	Phone Ext.:	Assigned Work Headquarters:
Jobsite Supervisor:	Witness:	Location Wh	nere Accident (Occurred:	Department:	Part of Body Affected
Hospital or Clini	c and Attendir	ng Physician:	Accident type	e:(Cut/Strain)	Time Loss: Ye	es* No etv (x5587) & Claims (x8556)
Property Damag	je:	PL Oti	JD Vehicle #: _ her:	s	,	Attach Vehicle Accident Report Form #1475
Property Owner	ship Name an	d Address:				
SECTION 2: EM ACCIDENT AND	PLOYEE - DES /OR INJURY O	CRIBE WHAT Y	OU WERE DOII	NG BEFORE AND EE PRELIMINAR	DURING THE ACCID	ENT AND HOW THE ETED.
SECTION 4: IMM SECTION 5: RO you must ask W determined.	ALLEDED FOOL MEDIATE CAUS OT CAUSES – HY the action(s	below. (For mo BES – Obvious a Less obvious ro s)/condition(s) o	action(s)/condit easons that cor occurred. Cont	tion(s) contributir ntributed to the a inue to ask the q	lent Review Guide pa ng to the accident. ccident. To determin uestion until all contr	e these types of causes, ibuting factors have been
SECTION 6: WH	AT RECOMME	NDATIONS/CO	RRECTIVE ACT	IONS WILL BE TA	KEN?	
Assigned To:			Target Date:	:	Date	of Completion:
PERSON ASS IF APPROPRIAT RECOMMENDAT	SIGNED TASK E, IDENTIFY TI FIONS:	WILL BE RESP HE PAGE IN TH	ONSIBLE FOR I	PROVIDING SAFE REVENTION MAN	TY DEPARTMENT W	ITH COMPLETION DATE. 'S ANY
1.				4.		
Signature of Err	ployee		Date	Reviewed by D	Dept Supt., Mgr., Sr.	Mgr. Date
2.	60. 80			5.	48 455 95 188	
Signature of Su	pervisor		Date	Reviewed by A	Assistant General Ma	nager Date
SEND CO	PY TO SAFE	TY BEFORE R	OUTING	Doulowed by C) of ohe	Data
PI	ROVIDE CO	PY TO EMP WIT	LOYEE AN	D ROUTE OR WORKING	IGINAL FOR SIG DAYS	SNATURES

SUPERVISOR REPORT OF ACCIDENT (FORM 1379) - BACK

Supervisor Report of Accident (Form 1379)		Page 2
SECTION 1: SEVERITY		
Complete sections 1, 2, and 6, then sign and route the reaccident is a bump, bruise, or scrape that 1) does not and 2) it is reasonable that the outcome could not have	report for a minor injury accident. Definition of a minor inju not appear to require medical treatment other than first a have been serious.	ry id;
ALL OTHER ACCIDENTS such as strains, sprains, or serious injury require all sections to be completed. bandage but could have resulted in the loss of a finger.)	or injuries that resulted in/or had the potential of resultin I. (Example: Using a saw and nicking a finger that only require .)	g in a ed a
Safety Awareness Form #1622 can be used to prevent regarding incidents or close calls that do not result in pro-	ent a potential future accident by sharing information with other property damage/injury/illness.	rs
SECTION 2: Employee to provide brief explanation	n of what occurred	
SECTION 3: Please include as much detail as possi	sible; pictures/drawings are helpful.	
SECTION 4: POSSIBLE IMMEDIATE CAUSES - Chec	eck all applicable and describe findings in Section 4 on fr	ront of
form. Example: Chain failed on forklift dropping load an	and damaging items in boxes	
ACTIONS	CONDITIONS	
Operating Equipment without authority	Guards or barriers	
Warning/Communication	Effectiveness of protective equipment	
Securing	Defective Tools, equipment or materials	
Operation at improper speed	Congestion or restricted action	
Safety devices inoperable	Warning system	
Defective Equipment	Fire and explosion hazards	
Use of personal protective equipment	Housekeeping	
Loading		
Placement	Hazardous environmental conditions:	
Liftina/Pushina/Pullina	Noise exposures	
Positioning for task	Radiation exposures	
Servicing equipment in operation	High or low temperature exposures	
Horseplay	Inadequate or excess illumination	
Acts of others	Inadequate ventilation	
Other Findings	Other findings	
SECTION 5: POSSIBLE ROOT CAUSES – Check all a Example: Why did the chain fail? Possible root causes:	II applicable and describe findings in Section 5 on front of s: Equipment fatigue/maintenance/inspection	f form.
PERSONAL FACTORS	JOB FACTORS	
Physical	Leadership/Supervision	
Knowledge/Training	Engineering	
Skill	Maintenance	
Stress	Tools/Equipment	
Wear and tear	Work Standards	
Other	Other	
SECTION 6: POSSIBLE CORRECTIVE ACTIONS TO	O CONSIDER – Use to complete Section 6 on front of form	n.
Review/evaluate pre-job planning/tailgate meeting		
Review standards/procedures/policies for inspecting and main	intaining equipment/materials/tools.	
Perform job safety analysis to recognize existing or potential h	hazards.	
Specify proper tool/equipment/material to be used in a procedu	dure/policy or training	
Evaluate equipment design to make it more compatible with hu	human capabilities and limitations.	
Evaluate personal protective equipment and training requireme	ments for this job task.	
Evaluate purchasing and distribution methods.		
Evaluate housekeeping policy/program	cy.	
Evaluate and modify procedure/policy as necessary		
Evaluate employee training on procedure/policy.		
Evaluate supervisor training in hazard recognition and reportin	ting standards/procedures/policies.	
Review supervisor responsibility to correct deviations.		
Evaluate follow up on incident action items.		

PUBLIC UTILITY DISTRICT NO. 1 1379A May 2016	EMPLOYEE PRELIMINARY REPORT OF ACCIDENT						
Date of Accident:	Hour of Day AM PM		Name of Employ		Phone Ext.:		
Occupation:		Assign Locatio	ed Work on:	Department:	Time Loss: Yes No *If YES contact Safety at x5587 and Claims at x8558		
Supv. At Job Site:	Witness:	Locatio	on where Accident	Occurred:			
Hospital or Clinic and Atte	nding Physician:	Accide	nt type:(Cut/Strain)	Part of Body A	Affected _Right	
Property Damage:	Property Damage:				Attach Vehicle Report Form #	e Accident #1475	
Property Ownership Name	e and Address:	_					
EMPLOYEE: DESCRIBE WH	HAT YOU WERE DOING	AT THE TIM	E OF THE ACCIDENT	AND HOW ACCIE	ENT AND/OR INJ	URY OCCURRED.	
Signature of Employee:				D	ate:		
WHAT RECOMM	IENDATION 8 WOULD YO	DU MAKE T	O PREVENT THIS TYP	PE OF ACCIDENT	FROM REOCCURE	RING?	
		AL TO SU	JPERVISOR UPO		N. PT FORM #422	9	

This form is located in District vehicles. It is contained in an envelope that also includes registration and mandatory insurance information. A description of the envelope is on the next page.

PRELIMINARY VEHICLE ACCIDENT REPORT (FORM 1475) FRONT/BACK

	Section 4: WITNESSES	
Name:		
Address:		_
Phone #:		5
Name:		
Address:		_
Phone #:		_
Name:		
Address:		
Phone #:		

ADDITIONAL NOTES

1475 (rev 11/12)

PUD PRELIMINARY VEHICLE ACCIDENT REPORT

If involved in an accident:

- 1. Call "911" to report the accident.
- 2. Notify the District's Energy Control Center at (425) 783-5040. Tell them if you have contacted "911" and provide the following;
 - a. Your name
 - b. The accident location
 - c. PUD vehicle #
 - d. Description of the accident, including injuries
 - e. Your supervisors name
 - f. Your contact phone number
- 3. If able, take photos of the damage scene, including the involved vehicles and other property damage.
- 4. Complete this report while at the accident scene.
- 5. Provide this report to your supervisor when you return to the office.

Note: Do not admit fault, liability or comment on what happened to anyone other than the police officer at the scene. If the other driver asks to contact the District to file a claim, advise the driver to call **(425) 783-8417**.

Employee Name:			
Date:		Time:	
Location (incl. intersec	ting stre	ets):	
City:			Direction of Travel:
Responding Law Enfor	cement	Agency:	ý.
Law Enforcement Repo	ort #:		
Were citations issued?	🛛 Yes	🛛 No	If Yes, to whom:
For what?			
Describe the Accident,	causes,	weather	and road conditions:

Section 2	: VEHICLE AND DRIVER INFORMATION	Section 3: INJURIES/PROPERTY DAMAGE
Your Name:	PODVEHICLE	Describe injuries:
Driver's License #.	c	
DITO Vehicle #	License Dlate #•	1. Name
Vehicle Year:	Make: Model:	Check one: 🖸 PUD Driver 📮 PUD passenger
Mark areas of veh	nicle damage:	Vehicle 2 Driver Vehicle 2 Passenger
		Nature of injuries:
		Aid provided at scene? 🗅 Yes 🗅 No 🛛 Transported? 🗅 Yes 🕞 No
		Where:
		2 Name
		Check one: D DUD Driver D DUD passenger
	d Minima / 11	U Vehicle 2 Driver U Vehicle 2 Dassenger
		Nature of injuries:
		Aid provided at scene? Yes No Transported? Yes No
		Where:
	OTHER VEHICLE	
Driver's Name:		3. Name
Address:	Phone #:	Check one: PUD Driver PUD passenger
Driver's License #:	License Plate #:	□ Vehicle 2 Driver □ Vehicle 2 Passenger
State:		Nature of injuries:
Vehicle Year:	Make: Model:	Aid provided at scene? 🗆 Yes 🗆 No 🛛 Transported? 🖵 Yes 🗔 No
Registered Owner	:	Where:
Insurance Compar	ny Name:	4. Name
Policy #:	Ins Co Phone:	Check one: D PUD Driver D PUD passenger
Mark areas of veh	ticle damage:	Vehicle 2 Driver Vehicle 2 Passenger
		Nature of injuries:
		Aid provided at scene? 🗆 Yes 🗆 No 🛛 Transported? 🗆 Yes 🗔 No
	ET SEL	Where:
		was other property damaged (e.g., fences, landscaping, etc.)?
	d Illigan and the	If Ies, describe:
		3
	(\cap)	

An envelope with registration and mandatory insurance information is located in District vehicles. Preliminary Vehicle Accident Report may be found inside the envelope.



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REGISTRATION AND MANDATORY INSURANCE INFORMATION

CERTIFICATE OF SELF-INSURANCE

ISSUED BY: Public Utility District No. 1 of Snohomish County PO Box 1107 Everett, WA 98206	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY SELF INSURANCE LIABILTY PROGRAM.
INSURED: Public Utility District No. 1 Of Snohomish County	COVERAGE AFFORDED BY: Public Utility District No. 1 of Snohomish County
PO Box 1107 Everett, WA 98206	PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY IS SELF-INSURED FOR TORT LIABILITY CLAIMS. ALL CLAIMS MUST BE FILED WITH THE PUD'S OFFICE OF RISK MANAGEMENT FOR PROCESSING IN ACCORD WITH STATUTORY REQUIREMENTS.

Snohomish County PUD Accident Prevention Manual Section U: Accident Reporting

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NEAR MISS/SAFETY LEARNING OPPORTUNITY FORM (2273)

-	
SAFETY FIRST	Near-Miss / Safety Learning Opportunity Questions about the reporting process? Please contact the Safety Department at x4441 or your Safety Chai
Near-Miss / Safety Learning Opportu personal injury or damage to non-Distri safety culture and performance.	unity: An unintended, unplanned and/or unexpected event that could have but did not result in ict property. An opportunity to improve health and safety practices in an effort to progress our
Date of Incident:	Time:AM / PM
Department:	Incident Location:
Near-Miss / Safety Learning Opportu	mity Summary:
Preventative Actions and Recommen-	dations
	Before You Start, Be Safety Smart

WORK AREA PROTECTION / TRAFFIC CONTROL

All traffic control signs or devices used for protection of construction workers must conform to and be set up according to Part VI of the Manual on Uniform Traffic Control Devices (MUTCD), as currently modified and adopted by the Washington State Department of Transportation.

Work area protection is the adequate safeguarding or protecting of pedestrians, motorists, District employees and equipment by use of approved barriers, warning signs, lights, flags, traffic cones, high level standards, barricade rope, flaggers, etc., as the job requires, on approaches to work areas, excavations, open-access holes, parked equipment, etc. Proper work area protection shall be planned to ensure the safety and protection of all workers, the public and equipment.

Work area protection is accomplished by the use of good informative and protective devices, keeping in mind that a safe installation requires the use of these devices in relation to the location of the workers and the equipment involved. The use of these devices must be coupled with proper planning, design, installation, inspection, maintenance and the use of good common sense. It is of utmost importance that the work area be properly identified and that warning devices convey the message to the traveling public well in advance of their arrival at the work area.

The public must be warned in advance, then regulated and guided safely through or around the work area per DOT Standards.

SIGNALING AND FLAGGERS

Definition

Flagger means a person who provides temporary traffic control.

- (1) General requirements for signaling and flaggers:
 - (a) When flaggers are used, employees must first apply the requirements in this section. Then you must set up and use temporary traffic controls according to the guidelines and recommendations provided in this chapter and the Traffic Control Flagger Certification Handbook.
 - (b) Job site workers with specific traffic control responsibilities must be trained in traffic-control techniques, device usage, and placement.
- (2) When to use flaggers:
 - (a) Flaggers are to be used only when other reasonable traffic-control methods will not adequately control traffic in the work zone.
 - (b) If signs, signals, and barricades do not provide necessary protection from traffic at work zones and construction sites on or adjacent to a highway or street, then you must use flaggers or other appropriate traffic controls.

(3) Flagger signaling:

- (a) Flagger signaling must be with sign paddles approved and supplied by the District.
- (b) During emergency situations, red flags may be used to draw a driver's attention to particularly hazardous conditions. In non-emergency situations, a red flag may be held in a flagger's free hand to supplement the use of a sign paddle.
- (4) Adequate warning of approaching vehicles. The District must:
 - (a) Position work zone flaggers so they are not exposed to traffic or equipment approaching them from behind.

If this is not possible, then the District must develop and use a method to ensure that flaggers have adequate visual warning of traffic and equipment approaching from behind.

Note:

- The following is an optional example of a method that may be used to adequately warn or protect flaggers:
 - Mount a mirror on the flagger's hard hat;
 - Use an observer;
 - Use jersey barrier;
- The District recognizes the importance of adequately trained flaggers and supports industry efforts to improve the quality of flagger training. However, training alone is not sufficient to comply with the statutory requirements of revising flagger safety standards to improve options available that ensure flagger safety and that flaggers have adequate visual warning of objects approaching from behind them.
- (5) High-visibility garments for flaggers.
 - (a) While flagging during daylight hours, a flagger must at least wear, as an outer garment:
 - A high-visibility safety garment designed according to Class 3 specifications in the ANSI/ISEA 107-1999, American National Standard for High-Visibility Safety Apparel consisting of at least seven-hundred and seventy five (775) square inches of background material that are fluorescent yellow-green, fluorescent orange-red or fluorescent red in color; and
 - Two-hundred and one (201) square inches of retroreflective material that encircles the torso and is placed to provide 360-degree visibility around the flagger.
 - A high-visibility hard hat that is white, yellow, yellow-green, orange or red in color.
 - White coveralls, or other coveralls or trousers that have retroreflective banding on the legs designed according to ANSI/ISEA 107-2015 standards.
 - When snow or fog limit visibility, pants, coveralls or rain gear, meeting these additional requirements must be worn:
 - In a highly visible color;

- With retroreflective banding on the legs;
- Designed according to ANSI/ISEA 107-2015
- A high-visibility hard hart:
 - Marked with at least twelve (12) square inches of retroreflective material applied to provide 360 degrees of visibility.
- (6) Flagger training. The District must make sure that:
 - (a) Each flagger has in their possession:
 - A valid Washington traffic control flagger card; or
 - A valid flagger card from a state such as:
 - Oregon;
 - Idaho;
 - Montana;
 - OR
 - Other states having a flagger training reciprocity agreement with Washington
 - (b) The flagger card shows the following:
 - Verification that the flagger training required is completed;
 - Date the flagger received their flagger training;
 - Name of the instructor providing the flagger training;
 - Name of the state that issued the flagger card;
 - The card's expiration date, not to exceed three (3) years from the date of issuance;
 - The flagger's picture or a statement that says "valid with photo ID."

Exemption

Personnel that have not completed a flagger-training course may be assigned duties as flaggers only during emergencies. Emergency assignments are temporary and last only until a certified flagger can be put into the position.

Definition

For the purpose of this rule, emergency means an unforeseen occurrence endangering life, limb, or property.

- (7) Flagger orientation and traffic control plan.
 - (a) The District foreman/crew lead, must conduct an orientation that familiarizes the flagger with the job site. This requirement applies each time the flagger is assigned to a new project or when job site conditions change significantly.

The orientation must include, but is not limited to:

• The flagger's role and location on the job site;

- Motor vehicle and equipment in operation at the site;
- Job site traffic patterns;
- Communication and signals to be used between flaggers and equipment operators;
- On-foot escape route;
- Other hazards specific to the job site.
- (8) Advance warning signs.
 - (a) The District must provide the following on all flagging operations:
 - A three (3) sign advance warning sequence on all roadways with a speed limit below 45 mph.
 - A four (4) sign advance warning sequence on all roadways with a 45 mph or higher speed limit.
 - (b) Warning signs must reflect the actual condition of the work zone. When not in use, warning signs must either be taken down or covered.
 - (c) The District must make sure to follow Table 1 for spacing of advance warning sign placement.

Road Type	Speed	Distances Between Advance Warning Signs *						
		A**	B**	C**	D**			
Freeways &	70	1500 ft +/- or	1500 ft +/- or	1500 ft +/- or	1500 ft +/- or			
Expressways	55	per the	per the	per the	per the			
		MUTCD	MUTCD	MUTCD	MUTCD			
Rural Highways	65	800 ft +/-	800 ft +/-	800 ft +/-	800 ft +/-			
	60							
Rural Roads	55	500 ft +/-	500 ft +/-	500 ft +/-	500 ft +/-			
	45							
Rural Roads & Urban	40	350 ft +/-	350 ft +/-	350 ft +/-	N/A			
Arterials	35							
Rural Roads, Urban	30	200 ft ***	200 ft ***	200 ft ***	N/A			
Streets, Residential	25							
Business Districts								
Urban Streets	25 or	100 ft ***	100 ft ***	100 ft ***	N/A			
	less							

Table 1. Advance Warning Sign Spacing

* All spacing may be adjusted to accommodate interchange ramps, at-grade intersections, and driveways.

** This refers to the distance between advance warning signs. See Figure 1, Typical Lane Closure on Two-Lane Road. This situation is typical for roadways with speed limits less than 45 mph.

*** This spacing may be reduced in urban areas to fit roadway conditions.

Exemption

In a mobile flagging operation, when the flagger is moving with the operation, the "flagger ahead (symbol or text)" sign must be:

- Within 1,500 feet of the flagger;
- The flagger station must be seen from the sign.

If terrain does not allow a motorist to see the flagger from the "flagger ahead" sign, the distance between the flagger and the sign must be shortened to allow visual contact, but in no case can the distance be less that the distance specified in Table 1.



Figure 1, Advanced Warning Sign Spacing.

Definition: Road user means a vehicle operator, bicyclist or pedestrian within a public roadway, including workers in temporary traffic control zones.

- (9) Providing a safe job site for flaggers. District foremen/crew leads must assure that:
 - (a) Flagger stations are located far enough in advance of the work space so the approaching road users will have sufficient distance to stop before entering the work space. Follow Table 2 for the distance of the flagger workstation in advance of the work space.

Speed* (mph)	Distance** (ft)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

Table 2. Distance of Flagger Station in Advance of the Work Space

*Posted speed, off-peak 85th-percentile speed prior to work starting or the anticipated operating speed.

**This spacing maybe reduced to fit roadway and worksite conditions. Distances greater than those listed in the table are acceptable.

- (b) Flaggers stand either on the shoulder adjacent to the road user being controlled or in the closed lane prior to stopping road users. A flagger must only stand in the lane being used by moving road users after road users have stopped.
- (c) Flagger workstations are illuminated during hours of darkness by floodlights that do not create glare that poses a hazard for drivers.

Note: To identify potential glare, observe the lighted area from various directions and angles on the main roadway after initial light setup.

EXEMPTION: Emergency situations are exempt from these illumination requirements. For the purpose of this rule, emergency means an unforeseen occurrence endangering life, limb or property.

- (d) Flaggers are not assigned other duties while engaged in flagging activities.
- (e) Flaggers do not use devices that may distract the flagger's vision, hearing, or attention.
 - 1. Examples of these devices include cell phones, pagers, radios, and headphones.
 - 2. Devices such as two-way radios used for communications between flaggers to direct traffic or ensure flagger safety are acceptable.
- (f) Flaggers receive a rest period of at least ten (10) minutes, on the District's time, for each four hours of working time.

- Rest periods must be scheduled as near as possible to the midpoint of the work period.
- A flagger must not be allowed to work more than three (3) hours without a rest period.

Exemption

Scheduled rest periods are not required when the nature of the work allows the flagger to take intermittent rest periods equivalent to ten (10) minutes for each four (4) hours worked.

Definitions

Barricade means an obstruction to deter the passage of persons or vehicles.

Signs are the warnings of hazard, temporarily or permanently affixed or placed, at locations where hazards exist.

Signals are moving signs, provided by workers (such as flaggers) or by devices (such as flashing lights) to warn of possible or existing hazards.

EXCAVATIONS

Excavations, in addition to being properly barricaded and protected with adequate warning devices, must be properly shored to avoid cave-ins and the necessary precautions must be taken to assure proper support of loads adjacent to the excavated area.

Excavations should be filled as soon as possible.

If an excavation is left open at night and it is in, or adjacent to, a traveled area, it is advisable to cover the entire excavation with substantial covering, if possible. This is in addition to the barricades, signs, lights, etc.

Excavations, trenches and obstructions, where exposed to traffic, shall be marked with proper signs during the day and lit at night with amber lanterns, lights or flashers, so located as to be visible to motorists and pedestrians.

Interference with vehicular and pedestrian traffic shall be avoided whenever possible. Because this is not always possible, it is necessary that adequate covering be installed and a watch service established whenever indicated.

Crossings must be suitably and definitely defined to eliminate the hazard to both vehicles and pedestrians. Covers must be strong enough to support passing traffic and be fastened down or otherwise secured so that they will not shift, tilt or collapse and must be constructed in a manner so as not to constitute a hazard in themselves.

The successful execution of a job depends upon **PROPER SUPERVISION**. One of the most important roles of supervision is the issuance of the necessary instructions and making sure that they are properly understood and carried out. Lead workers, or the person-in-charge, should plan the necessary controls and make certain the required warning devices and flaggers are in place and that all precautionary measures to safeguard the workers and the public have been taken **PRIOR TO STARTING THE JOB**, **REGARDLESS OF THE DURATION OF THE WORK**.

THOSE RESPONSIBLE FOR THE JOB SHALL

Thoroughly plan work in advance, so as to ensure safety and to keep interference with traffic and worksite at a minimum. For jobs requiring traffic control longer than one day, a traffic control plan must be onsite. This plan may be approved by the state, local entities, or the District. Have the Accident Prevention Manual, along with the Flagger's Handbook, on site for information regarding particular situations.

The plan should include things such as: The location and timing of the job; the types, speed and volume of traffic; and number and locations of the signs, lights, barricades, cones, etc., necessary to complete the job safely. All warning devices shall be of the proper type, legend, color, and adequate to warn and guide the travelling public.

Inspect the protected work area prior to starting work operations to determine if adequate protection is provided.

Make sure the control devices are adequate, in good working order, properly maintained and removed when no longer needed.

OPERATION OF VEHICLES AND EQUIPMENT WITHIN SERVICE AREA

The following procedures shall be followed when parking counter to traffic flow for short duration stops:

- 1. Before proceeding into the oncoming traffic lane, emergency lights are required to warn traffic of impending hazards; such lights shall be of the 360 degree flashing variety. The vehicle or equipment shall wait until a safe crossing can be made as determined by the operator of the vehicle or equipment.
- 2. Once in position, suitable warnings in the form of traffic cones or other such devices as may be provided, shall be placed to warn oncoming traffic of unusual circumstances.
- 3. For work during the hours of darkness, or when the visibility is poor, such as fog, flashing lights, spot lights, area illumination and/or flares shall be used to supplement cones.

When a particular traffic problem exists, notify your supervisor and explain the circumstances. Determine whether law enforcement should be requested to assist with traffic control.

For jobs not considered short duration, required traffic control shall be in place before the vehicle(s) move into position.

FLAGGING

Flaggers

Flaggers are responsible for the safety of the workers, motorists and themselves. Their job of controlling traffic can be one of the most important parts of an operation. Because of this tremendous responsibility and their contact with the public, it is essential that only certified employees be selected for this position

Flaggers shall ensure they can fully observe the operation and guard vehicular traffic in such a manner as to minimize the possibility of accidents or injury. A reflectorized hard hat with an attached rear-view mirror and retro-reflective vests are required.

Flaggers are provided at work sites to stop traffic intermittently as necessitated by work progress or to maintain continuous traffic past a work site, at reduced speeds, to help protect the work crew. For both of these functions, the flagger must, at all times, be clearly visible to approaching traffic for a distance sufficient to permit traffic to reduce speed before entering the work site. In positioning flaggers, consideration must be given to maintaining color contrast between the protective garments and the background.

Flaggers using hand signaling equipment shall ensure that signals provide sufficient warning to protect themselves and the work site.

Night flagging: While flagging during hours of darkness, the flagger must wear their hard hat and flagging vest over white coveralls, or over other coveralls or trousers that have retro-reflective banding on the legs designed according to ANSI/ISEA 107 standards. When snow or fog limit visibility, pants, coveralls or rain gear in a highly visible color with retro-reflective banding on the legs must be worn. Lights approved by the appropriate highway authority or reflectorized flags shall be used to flag traffic during the hours of darkness. Daytime flagging procedures shall be followed whenever such lights, paddles or flags are used at night.

Whenever practicable, the flagger should advise the motorist of the reason for the delay and the approximate period that traffic will be halted. Flaggers and crew members should be made to understand that every reasonable effort must be made to allow the driving public the right-of-way and prevent excessive delays.

Two flaggers: If two (2) flaggers are used, they must coordinate their efforts. One of them must be designated as the lead flagger. The other flagger will take signals and work off of the leader's paddle. The designation of lead flagger will depend on the traffic flow, lane obstruction, type of weather and topography.

Three flaggers: When three (3) flaggers are needed, the lead flagger will be the person positioned in the middle and must be clearly visible to the other two flaggers. The lead flagger must have a good vantage point to observe the traffic and control its flow. The other two (2) flaggers must display the same side of the paddle that they see the lead flagger using.

Radio flagging: Radio contact is one method that may be used when two (2) flaggers do not have visual contact with each other. Communication can be lost if radios fail or batteries wear out. If this should happen, the flagger must stop the traffic until the problem is solved.

If you are ever in doubt concerning radio contact, stop the traffic. The two-way radios should be used for radio communication between flaggers and cleared for usage through Crew Dispatch.

STORM FLAGGING

In order to reduce confusion amongst crews, the following has been complied of what is required for flagging during storms for those individuals whose normal duties do not require them to flag.

Review of current guidelines set for the in the flagging certification guidelines

- 1. Flaggers must be part of the job briefing.
- 2. No cell phones, CDs or tape players are allowed to be used while flagging.
- 3. A relief person must be certified.

Flaggers shall wear a Class 3 warning retro-reflective vest and hard hat with four yellow iridescent stickers around the brim providing 360-degrees of visibility.

The District currently purchases Class three (3) vests/outer garments.

New or replacement equipment from the Warehouse will require a completed tool request form signed by your supervisor. This includes, but is not limited to: vests, hard hats, coveralls, raingear, flashlights, mirrors, reflectors, etc. The District does not provide for carry/duffle-type bags for these items, as we do not supply them to our permanent on-call District flaggers.

SHORT DURATION WORK ZONE SAFETY

Short Duration – Work that occupies a location up to sixty (60) minutes.

Depending on the work zone conditions, in short-duration operations of sixty (60) minutes or less, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity, rotating, flashing, oscillating lights is used.

Safety in short-duration work zones shall not be compromised by using fewer devices simply because the operation will frequently change location. Cones may be the best safety practice since they are quick to set up for small work zones.

Worker safety risk considerations cannot be ignored no matter how short the worktime duration. A common example of this is a high-speed and high-volume traffic roadway with an in lane work operation. Although the work duration may be very short, work hazards may need to be considered for stationary lane closures because the hazard to workers and road users could be too great.

Careful consideration of traffic and roadway conditions must be given to each work zone prior to selecting the most appropriate traffic control set-up. Shoulder work and low-speed, low-volume traffic conditions may only require the use of the work vehicle hazard beacon and personal protective equipment. High-speed, high-volume lane work may require a full lane closure set-up, even though the work duration may be sixty (60) minutes or less. Remember, short-duration work is not a short-cut, it's a traffic-control method that reduces worker exposure to traffic hazards by using larger, more dominant and mobile equipment instead of many smaller devices (cones may still be recommended since they are easily set up for small work zones).

An on-site assessment may allow work to proceed with available equipment and devices. Strategic placement of the work vehicle with warning beacon is important. Devices and signs may also be needed.

Key Elements of Short Duration Work Zones

Work Location: This element may be the most obvious, but also the most important, at least initially, since it establishes the relationship to the next three (3) elements. The location directly influences the assessment of hazards, protection and warning. General roadway locations such as shoulders, lanes, medians, etc. are common but unique locations with narrow shoulders, bridges, undefined shoulders (no edge stripe), poor sight distance, tight radius curves, etc. require even more consideration.

Hazards: This element is essential to determine and address safety hazards to workers and road users. Traffic volume and speed is the primary hazard concern for workers in the short duration work zones, while unexpected workers or equipment are the primary hazard for drivers.

Protection: This element establishes an appropriate level of worker protection based on assessment of the hazards involved. Positive worker protection is always recommended when practical but not necessarily required for less hazardous work zones. The use of a protective vehicle (work vehicle) can offer valuable worker protection in any work zone condition.

Warning: This element provides for establishing the appropriate level of warning for drivers approaching and driving through the work zone. Advanced warning to drivers is required when working within fifteen (15)' of the edge of the roadway. In many short duration work zone locations the work vehicle warning beacon, assuming there is adequate sight distance, can provide this. Sign(s) may be needed for areas with reduces sight distance.

Duration: This element is equally important as work location since it has a direct relationship to worker exposure to hazards. Duration also has the most influence over the other key elements. As mentioned in previous guidance, short duration work zones may offer safety and mobility benefits, but not at the risk of worker exposure to hazards.

Short Duration Work Zones Condition

Short duration work zones are categorized into three (3) relative condition types. This helps to establish a practical application level of traffic control and safety devices based on hazard protection and warning levels related to work location and time duration. The MUTCD allows for simplified traffic control procedures for short duration work, but does not go into any detail on what those simplified procedures might be. Establishing a work zone condition level helps to answer the question; "Which traffic control and safety devices are appropriate for use as part of the allowed simplified procedures?"

The condition levels are:

A. Represents the lowest level of work zone impacts and is typified by:

- Low traffic speed. (25 to 30 mph posted)
- Rough estimate of traffic volume at less than 5 (five) vehicles per lane per minute.

- Time durations are short or very short, approximately 0 to twenty (20) minutes. Work locations, not within a traveled lane, such as shoulders, may allow up to sixty (60) minutes.
- A wide variety of work locations may be encountered at this level.
- Minimum levels of warning, protection and hazards may be used. A work vehicle with warning beacon and personal protective equipment may be adequate.
- B. Represents moderate work zone impacts and is typified by:
 - Low or high traffic speed. (25 to 40 mph posted)
 - Rough estimate of traffic volume at twelve (12) vehicles per lane per minute.
 - Moderate time durations, approximately 0 to forty (40) minutes. Work locations not within a traveled lane, such as medians, may be allowed up to sixty (60) minutes.
 - A wide variety of work locations may be encountered at this level that may include median, gore lanes and intersections.
 - Moderate levels of warning and protection, such as a spotter, cones or PCMS added to condition A devices would be typical considerations.

C. Represents the highest impact level and is typified by:

- High traffic speed (35 mph or greater posted).
- A rough estimate of twenty (20) vehicles per lane per minute.
- Maximum time duration, up to sixty (60) minutes.
- A wide variety of work locations may be encountered at this level, but all should be considered as presenting a significant hazard level when durations are short.
- All applicable traffic control and safety devices should be considered, such as PCMS, TMA and signs.

The short duration work zone condition level does not necessarily provide for a complete or final assessment, however, it is a valuable tool for finding the best balance between time duration and the other work zone key elements. Time duration is an important consideration for short duration work zones; worker safety risk consideration cannot be ignored no matter how short the work time duration.

DO'S AND DON'TS.

Do	Don't
 Use the work vehicle as protection and warning whenever possible. Take advantage of resources providing protection and warning without causing additional exposure. (TMAs, buffer/shadow vehicles, PCMSs, etc.) Plan ahead. Poor planning is not a valid excuse for lack of equipment, devices or awareness of traffic conditions. Find the safest available location to park or unload equipment. Avoid high traffic volume hours and locations. Plan ahead for better traffic conditions or consider alternate work operations. Work on the same side of the road as the work vehicle and warning beacon whenever 	 Take "short cuts" or hurry to accomplish work. Determination of all work zone hazards is a must. Run across or "dodge" traffic in live lanes. Work in a live lane under adverse traffic conditions or without proper traffic control in placeeven if it is only for a few minutes or a few seconds. Assume shoulder areas are automatically safe. Distracted, aggressive or impaired drivers may encroach. Also, oversize loads may present a hazard. Turn your back to oncoming traffic if possible. Put yourself in an unexpected location that may surprise a driver.
possible.	

DATA SECTION

TEMPERATURE CHART: Temperature (F°)

Wind Chill = 35.74 + 0.6215 x t - 35.75 (w°.16) + 0.4275 x t (w°.16)

T = Air Temperature (F°) w = Wind Speed Shaded box = frostbite occurs in less than 15 minutes

	Calm	40	35	30	25	20	15	10	5	0	-5
w											
i											
n	5	36	31	25	19	13	7	1	-5	-11	-16
d	10	34	27	21	15	9	3	-4	-10	-16	-22
	15	32	25	19	13	6	0	-7	-13	-19	-26
S	20	30	24	17	11	4	-2	-9	-15	-22	-29
р	25	29	23	16	9	3	-4	-11	-17	-24	-31
е	30	28	22	15	8	1	-5	-12	-19	-26	-33
е	35	28	21	14	7	0	-7	-14	-21	-27	-34
d	40	27	20	13	6	-1	-8	-15	-22	-29	-36
	45	26	19	12	5	-2	-9	-16	-23	-30	-37
Μ	50	26	19	12	4	-3	-10	-17	-24	-31	-38
P	55	25	18	11	4	-3	-11	-18	-25	-32	-39
н	60	25	17	10	3	-4	-11	-19	-26	-33	-40

HOW HOT IT FEELS

Studies indicate under normal conditions, temperature and humidity are the most important elements influencing body comfort. This table from the NOAA's National Weather Service shows the apparent temperature – how hot the weather feels – at various combinations of temperature and humidity.

Air Temperature													
	70	75	80	85	90	95	100	105	110	115	120		
Relative Humidity		Apparent Temperature (F°)											
0%	64	69	73	78	83	87	91	95	99	103	107		
10%	65	70	75	80	85	90	95	100	105	111	116		
20%	66	72	77	82	87	93	99	105	112	120	130		
30%	67	73	78	84	90	96	104	113	123	135	148		
40%	68	74	79	86	93	101	110	123	137	151			
50%	69	75	81	86	96	107	120	135	150				
60%	70	76	82	90	100	114	132	149					
70%	70	77	85	93	106	124	144						
80%	71	78	86	97	113	136							
90%	71	79	88	102	122								
100%	72	80	91	108									

DEGREE OF STRESS

When the apparent temperature rises above 130 degrees, the weather service warns it is extremely dangerous. Heat-stroke or sun-stroke may be imminent. Between 105 degrees and 130 degrees, sun-stroke, heat cramps or heat exhaustion is possible. So is heat-stroke with prolonged exposure along with physical activity. Between 90 degrees and 105 degrees, sun-stroke, heat cramps, and heat exhaustion are possible with lengthy exposure and activity.

NOTE: Degrees of heat stress may vary with age, health and body characteristics.

NOAA's National Weather Service

Heat Index

							Temp	peratur	e (F°)					
		80	82	84	86	88	90	92	94	96	98	100	102	104
	40	80	81	83	85	88	91	94	97	101	105	109	114	119
	45	80	82	84	87	89	93	96	100	104	109	114	119	124
	50	81	83	85	88	91	95	99	103	108	113	118	124	131
(%	55	81	84	86	89	93	97	101	106	112	117	124	130	137
ty (60	82	84	88	91	95	100	105	110	116	123	129	137	
nidi	65	82	85	89	93	98	103	108	114	121	128	136		
Hun	70	83	86	90	95	100	105	112	119	126	134			
ve	75	84	88	92	97	103	109	116	124	132				
elati	80	84	89	94	100	106	113	121	129					
Re	85	85	90	96	102	110	117	126	135					
	90	86	91	98	105	113	122	131						
	95	86	93	100	108	117	127							
	100	87	95	103	112	121	132							

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution

Extreme Caution

Danger

Extreme Danger

Γ	Lineman Rigger's Reference Card												
SI	Sling Capacities MECHANICAL SPLICE IN POUNDS DESIGN FACTOR = 5:1 (1)												
	Size in inches	VERTICAL		2 - Legs or Basket 90°	60°	45'	30	Color Code (Optional)	Size in inches				
	1/4	1,100	840 1 300	2,200	1,940 3.000	1,580 2,400	1,100	White Lt.Green	1/4 5/16 =	5			
IWRO	3/8	2,400	1,860	4,800	4,200	3,600	2,400	Red Yellow	3/8				
S I I	1/2	4,400	3,200	8,800	7,600	6,200	4,400	Lt. Blue	1/2 0				
6×19	5/8	5,500 6,800	4,200 5,000	13,600	11,800	9,600	6,800	Orange	5/8	5			
Rope	3/4 7/8	9,700 13,000	7,200 9,800	19.400 26,000	16,800 22,000	13,600	9,700	Dk.Green	7/8				
Wire	1 1-1/8	17,000	12,800 15,600	34,000 40,000	30,000 36,000	24,000	17,000 20,000	Purple Dk. Blue	1-1/8	ì			
Ц	1-1/4	25,000	18,400	50.000	42,000	34.000	25.000	Gold	1-1/4				

Formula to find sling length Load width x Multiplier = Sling Length

Lo	ad Fa	actors							2			
	$ \begin{array}{c} \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$											
5.	5,000 # 5.000 # Tension in c = $\frac{\text{length } c}{\text{length } a}$ x share of load wt. $\frac{c}{a}$ = Load Factor											
	b^{-1} Given: length $c = 10'$ and length $a = 8'$, what is tension in c?Solution: Tension in $c = \frac{10}{8} \times 5,000$, $Tc = 1.25 \times 5,000$, $Tc = 6,250 \#$											
1	How mu	ich tensio	n in chain	come-a-	long A?	A	-3'-1	-1' 3'	2			
-	Ten. in .	$A = \frac{3}{1} \times 4$,000	Ten. in	A = <u>12,00</u>	0 #	8.00	00 #				
	A 1		+2'	B	INVE Hoist A to 8 + 2 = 1	ERSE PRO ension $0, \frac{2}{10} = .2$	DPORTION Ho	TO DISTANC bist B tension $2 = 10, \frac{8}{10} =$				
	Offse	t C.G.	10.000 #		.20 x 10,0 A = 2.000	000 = 2,000 + 1/2 bear	.80 nwt. B:	= 8,000 + 1/2 b	eam wt.			
Sling Capacities DESIGN FACTORS - CHAIN 4:1, WEB 5:1, POLYPRO ROPE 6:1 3												
1 A 24	Size in inches	VERTICAL	CHOKER	2 - Legs or Basket 90°	60°	45°	30	Color Code (Optional)	Size in inches			
Chain G-8	9/32 3/8 1/2 5/8	3,500 7,100 12,000 18,100	2,620 5,300 9,000 13,500	7,000 14,200 24,000 36,200	6,050 12,300 20,800 31,300	4,950 10.000 17,000 25.600	3,500 7,100 12,000 18,100	Must be tagged for length & strength	9/32 3/8 1/2 5/8			
Flat Web	1-9-1 1-9-2 1-9-3 1-9-4 2-9-3 2-9-4	1,600 3,200 4,800 6,400 8,880 11,520	1,280 2,560 3,840 5,120 7,100 9,210	3,200 6,400 9,600 12,800 17,760 23,040	2,770 5,540 8,320 11,090 15,390 19,960	2,260 4,452 6,780 9,040 12,540 16,270	1,600 3,200 4,800 6,400 8,880 11,520	Must be tagged for type, length & strength	1-9-1 1-9-2 1-9-3 1-9-4 2-9-3 2-9-4			
Polypro Rope	1/2 9/16 5/8 3/4 7/8	645 780 950 1,300 1,760 2,140	325 390 475 650 880 1.070	1,290 1,560 1,900 2.600 3,520 4,280	1,120 1.350 1,650 2.250 3,050 3,700	910 1,100 1,340 1,840 2,490 3.030	645 780 950 1,300 1,760 2,140	Should be tagged for length & strength	1/2 9/16 5/8 3/4 7/8 1			









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Ope Diam. in inches Approx. Breaking Strength Vertical Eye Splice Bowline/ Clove Hitch Choke Kn 3/8 2440 406 365 243 203 1/2 3780 630 567 378 315 5/8 5600 933 839 560 466 3/4 7650 1275 1147 765 637 1 12600 2100 1890 1260 1050 3/8 3880 646 581 387 323 5/8 11600 1933 1739 1159 966 3/4 14500 2416 2174 1449 1208 1 25000 4166 3749 2500 2083 ***********************************							V	Vorking L	oad		
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	c	1/2		3780		630		567		378	315
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TENSILE STRENGTH OF MACHINE BOLTS THREADED

Calculation of tensile strength of machine bolts (including eye bolts) using varying stress factor of safety of 7 on area at root of thread. Formulae is for **TENSION**.

Ultimate strength of steel = 100,000 pounds per square inch.

- P = Total stress in pounds
- P = ASA/f = Area of cross section in square inches
- S = Ultimate stress in pounds per square inch of area of section
- f = Factor of safety for varying stress

Diameter of Bolt in	Cross Section Area at Root if Thread in	Safe Working Load in	Breaking Strength in
Inches	Square Inches	Pounds	Pounds
1/2"	.126	1,800	12,600
5/8"	.202	2,885	20,195
3/4"	.302	4,315	30,198
7/8"	.419	5,985	41,895
1"	.551	7,870	55,097
11/8"	.693	9,900	69,300
11/4"	.890	12,714	88,989
1 3/8"	1.054	15,057	105,400
1 1/2"	1.294	18,485	129,395
HOIST HOOKS WITH EYE – WELDLESS

Diameter of Eye			Extreme Dimensions (inches)			Approx. Load
Incido	Outside	Opening of Throat (inches)	Longth	W/idth	Safe Working Load Net.	Required to Straighten
			4 2 /9	2 7 /9		
5/4 7/8	1 3/4	1 1/16	4 7/8	3 1/8	.6	2.3
1	2	1 1/8	5 3/8	3 1/2	.7	3
1 1/8	2 1/4	1 1/4	6 3/16	3 7/8	1.2	5.7
1 1/4	2 1/2	1 3/8	6 7/8	4 3/8	1.7	7
1 3/8	2 3/4	1 1/2	7 5/8	4 7/8	2.1	8.5
1 1/2	3	1 3/4	8 9/16	5 5/8	2.5	10
1 5/8	3 1/4	1 7/8	9 9/16	6 3/4	3	13
1 3/4	3 1/2	2 1/16	10 3/8	6 7/8	4	17
2	4	2 1/4	11 1/2	7 1/2	4.7	19
2 3/8	4 5/8	2 1/2	13	8 1/4	5.5	26
2 3/4	5 1/4	3	14 3/4	9 1/4	6.8	32
3 1/8	6 1/8	3 3/8	16 3/4	11	8	35
3 1/2	7	4	19 1/8	13 1/2	11	48
4	8 1/2	4 1/2	22 3/4	15	20	80

Use of Chokers



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





Good Good No cutting action on running lines

Eye Splices

Hook Slings

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

Bad Practice – Hook openings should be turned out



Good Practice – Note use of thimble in eye splice



Good Practice – Use of thimble in eye splice



Good Practice – Hooks are turned out







Eye Bolts

Right – Load over 12-ft. long



Vertical lift on eyebolt is good practice

Bad Practice – Lifting on eye bolts from an angle reduces safe loads as much as 90%

Bad Practice -**Can bend flanges** and cut rope



Good Practice -Use space blocks and pad corners

Hoisting Structural Steel



Steel can cut rope





DATA SECTION

STANDARD HAND SIGNALS FOR CONTROLLING CRANE OPERATIONS



SWING. Arm extended, point with finger in direction of swing of boom.



STOP. Arm extended, palm down, move arm back and forth horizontally.



EMERGENCY STOP. Both arms extended, palms down, move arms back and forth horizontally.



HOIST. With forearm vertical, fore-finger pointing up, move hand in small horizontal circle.



LOWER. With arm extended down- ward, fore-finger pointing down, move hand in small horizontal circle.





USE MAIN HOIST. Tap flat on head; then use regular signals.

TRAVEL. Arm extended DOG EVERYTHING. forward, hand open and slightly raised, making pushing motion in direction of

travel.



Clasp hands in front of body.



TRAVEL (Both Tracks). Use both fists in front of body, making a circular motion about each other, indicating direction of travel, forward or backward (for land cranes only).



USE (Auxiliary Hoist). Tap elbow with one hand, then use regular signals.



extended, fingers

pointing upward.

closed, thumb

LOWER BOOM. Arm extended, fingers closed, thumb pointing downward.



TRAVEL (One Track). Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body (land cranes only).



RETRACT BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing toward each other.



EXTEND BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing outward.

(continued on next page)



MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal (Hoist slowly shown as example.)



LOWER THE LOAD. With arm extended,

thumb pointing up, flex thumb pointing down, fingers in and out as long as load movement as long as load is desired.



RAISE THE BOOM AND LOWER THE BOOM AND RAISE THE LOAD.

With arm extended, flex fingers in and out movement is desired.



EXTEND BOOM (Telescoping Boom): One hand signal. One fist in front of chest with thumb tapping chest.



RETRACT BOOM (Telescoping Boom): One hand signal. One fist in front of chest with thumb protruding outward and heel of fist tapping chest.

This section is not inclusive of all rules affecting tree-trimming operations.

Close inspection shall be made by the employee and by the lead worker or supervisor in charge before climbing, entering, or working around any tree, to determine whether an electrical power conductor passes through the tree, or passes within reaching distance of any employee working in the tree.

A competent person, properly experienced in the type of work, shall be placed in charge of falling and bucking operations. Inexperienced workers shall not be allowed to fall timber or buck logs unless working under the direct supervision of an experienced worker.

Employees engaged in trimming, removing, or clearing trees from lines shall be required to consider all overhead electrical power conductors to be energized until such energized lines have been de-energized and grounded in accordance with District policy.

Only qualified line-clearance tree trimmers or tree trimming trainees familiar with the special techniques and hazards involved in line clearing, shall be permitted to perform the work if it is found that an electrical hazard exists.

During all tree working operations aloft, where an electrical hazard of more than six-hundred (600) volts exists, there shall be a second employee or trainee qualified in line clearance tree trimming within normal voice communication.

Where tree work is performed by employees qualified in line-clearance tree trimming and trainees qualified in line-clearance tree trimming, the clearances from energized conductors given in Table 2, Section N-6, of the Accident Prevention Manual, minimum approach distances shall apply.

Branches hanging on an energized conductor may only be removed using approved insulated tools by a qualified line-clearance tree trimmer.

First aid. All employees whose duties require them to work near energized wires, or climb trees shall take an approved course in controlling bleeding and cardiopulmonary resuscitation, and be capable of aerial lift and tree rescue and remain proficient in its application.

HAND AND PORTABLE POWER TOOLS

The District shall ensure that each hand and portable powered tool, including any tool provided by an employee, is maintained in serviceable condition.

The District shall ensure that each tool, including any tool provided by an employee, is inspected before initial use during each workshift. At a minimum, the inspection shall include the following:

- 1. Handles and guards, to ensure that they are sound, tight-fitting, properly shaped, free of splinters and sharp edges, and are in place;
- 2. Controls, to ensure proper function;

- 3. Heads of shock, impact-driven and driving tools, to ensure that there is no mushrooming;
- 4. Cutting edges, to ensure that they are sharp and properly shaped; and
- 5. All other safety devices, to ensure that they are in place and function properly.

Employees shall use the tool only for purposes for which it has been designed.

When the head of any shock, impact-driven or driving tool begins to chip, it shall be repaired or removed from service.

The cutting edge of each tool shall be sharpened in accordance with the manufacturer's specifications whenever it becomes dull during the workshift.

Each tool shall be properly stored in the provided location when not being used at a work site.

Racks, boxes, holsters or other means shall be provided, arranged and used for the transportation of tools so that a hazard is not created for any vehicle operator or passenger.

Cord and plug-connected equipment supplied by premises wiring used in damp or wet location or by employees standing on the ground shall be grounded unless:

- 1. The portable tool is protected by an approved double insulating system or its equivalent and the tool is distinctively marked to show that it is double insulated; or
- 2. The power shall be supplied through an isolating transformer with an ungrounded secondary of not more than fifty (50) volts.

Any cord and plug-connected equipment supplied by other than premises wiring shall comply with one of the following:

- 1. It shall be equipped with a cord containing an equipment grounding conductor connected to the tool frame and to a means for grounding the other end (however, this option may not be used where the introduction of the ground into the work environment increases the hazard to an employee); or
- 2. It shall be of the double-insulated type as required above; or
- 3. It shall be connected to the power supply through an isolating transformer with an ungrounded secondary.

Portable and vehicle-mounted generators used to supply cord and plug connected equipment shall meet the following requirements:

- 1. The generator may only supply equipment located on the generator or the vehicle and cord and plug-connected equipment through receptacles mounted on the generator or the vehicle.
- 2. The non-current-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles shall be bonded to the generator frame.
- 3. In the case of vehicle-mounted generators, the frame of the generator shall be bonded to the vehicle frame.

4. Any neutral conductor shall be bonded to the generator frame.

Hydraulic and pneumatic tools must meet the following requirements:

- 1. Safe operating pressures for hydraulic and pneumatic tools, hoses, valves, pipes, filters, and fittings may not be exceeded.
- 2. If any hazardous defects are present, no operating pressure would be safe, and the hydraulic or pneumatic equipment involved may not be used in the absence of defects, the maximum rated operating pressure is the maximum safe pressure.

A hydraulic or pneumatic tool used where it may contact exposed live parts shall use non-conductive hoses and be so designed and maintained for such use.

The hydraulic system supplying a hydraulic tool used where it may contact exposed live parts shall provide protection against loss of insulating value for the voltage involved due to the formation of a partial vacuum in the hydraulic line.

Note: Hydraulic lines without check valves having a separation of more than thirty-five (35) feet between the oil reservoir and the upper end of the hydraulic system promote the formation of a partial vacuum.

A pneumatic tool used on energized electric lines or equipment or used where it may contact exposed live parts shall provide protection against the accumulation of moisture in the air supply.

Pressure shall be released before connections are broken, unless quick acting, self-closing connectors are used. Hoses may not be kinked.

Employees may not use any part of their bodies to locate or attempt to stop a hydraulic leak.

POWER CHAIN SAWS

Each chain saw shall be equipped with a chain brake. Any chain saw placed into service after February 9, 1995 shall be equipped with a protective device that minimizes chain saw kickback, i.e., reduced kickback bar, chains, bar tip guard or chain brake. No chain saw kickback device shall be removed or otherwise disabled.

The chain saw shall be operated and adjusted in accordance with the manufacturer's instructions.

The employee must inspect any chain saw initially before use during each work shift for at least the following;

- 1. The chain is properly adjusted;
- 2. The muffler is operational;
- 3. The chain brake and nose shielding devices are in place and properly functioning.

The chain saw shall be fueled at least ten (10) feet from any open flame or other source of ignition.

The chain saw shall be started at least ten (10) feet from the fueling area.

The chain saw shall be started on the ground or where otherwise firmly supported. Drop starting a chain saw is prohibited.

The chain saw shall be started with the chain brake engaged.

The chain saw shall be held with the thumbs and fingers of both hands encircling the handles during operation unless it can be demonstrated that a greater hazard is posed by keeping both hands on the chain saw in that particular situation.

The chain saw operator shall be certain of footing before starting to cut. The chain saw shall not be used in a position or at a distance that could cause the operator to become off balance, to have insecure footing or to relinquish a firm grip on the saw.

Prior to felling any tree, the chain saw operator shall clear away brush or other obstacles, which might interfere with cutting the tree or using the retreat path.

Chain saws shall not be used to cut directly overhead.

Chain saws shall be carried in a manner that will prevent operator contact with the cutting chain and muffler.

Chains saws shall be shut off or the throttle released before the feller starts their retreat.

The chain saw shall be shut down or the chain brake engaged whenever a saw is carried further than fifty (50) feet or when a saw is carried less that fifty (50) feet if conditions such as, but not limited to, the terrain, underbrush and slippery surfaces, which may create a hazard for an employee.

Each power saw weighting more that fifteen (15) pounds that is used in trees shall be supported by a separate line, except when work is performed from an aerial lift and except during topping or removing operations where no supporting limb will be available, and the following:

- 1. Each power saw shall be equipped with a control that will return the saw to idling speed when released.
- 2. Each power saw shall be equipped with a clutch and shall be so adjusted that the clutch will not engage the chain drive at idling speed.
- 3. A power saw shall be started on the ground or where it is otherwise firmly supported. Drop starting of saws over fifteen (15) pounds is permitted outside of the bucket of an aerial lift only if the area below the lift is clear of personnel.
- 4. A power saw engine may be started and operated only when all employees other than the operator are clear of the saw.
- 5. A power saw may not be running when the saw is carried up into a tree by an employee.
- 6. Power saw engines shall be stopped for all cleaning, refueling, adjustments, and repairs to the saw or motor, except as the manufacturer's servicing procedures require otherwise.

When using a chain saw while working in a lifeline, a ballistic cover must be installed on each side of the lifeline or a double lifeline must be used.

INSULATED TOOLS USED FOR TREE TRIMMING

Only insulated tools having manufacturer's certification of withstanding the following minimum tests shall be used:

- 1. 100,000 volts per foot of length for five minutes when the tool is made of fiberglass, or
- 2. 75,000 volts per foot of length for three minutes when the tool is made of wood; or
- 3. Other tests which equal or exceed (1) and (2) above of this subsection.
- 4. The District tests insulated tools once per year or anytime the condition of the tool is questioned.

All insulated tools shall be visually inspected each day before use. All insulated tools shall be wiped clean before being used.

Defective insulated tools shall not be used and shall be marked as defective and turned in for repair or replacement.

HAND TOOLS

All hydraulic tools which are used near energized lines or equipment shall use nonconductive hoses having approved strength for the normal operating pressures. Only approved fluid can be used and safe operating pressure shall not be exceeded.

All pneumatic tools which are used near energized lines or equipment shall have non-conducting hoses having approved strength for the normal operating pressures and have an accumulator on the compressor to collect moisture.

All tools shall be kept in good working condition and shall be properly stored. Defective tools shall be taken out of service.

UNCOMPLETED JOBS

Uncompleted jobs left after working hours:

- 1. All brush and debris which present a hazard shall be cleaned up before leaving the job. If this is not possible, adequate barricades and warning lights shall be provided. Contact your lead worker.
- 2. Ropes should not be left in trees. If ropes must be left in a tree at any time the crew leaves the job, they shall be tied off sufficiently high in the tree to prevent access for people on the ground.

Any cuts shall be completed once they have been started.

ON-THE-JOB CLOTHING

Wearing Apparel

Goggles, hard hats, hearing protection, and other such personal protective devices shall not be interchanged among employees unless they have been sanitized.

Employees whose duties require them to operate a power chain saw shall wear flexible ballistic nylon pads, sewn or otherwise fastened into the trousers, or other equivalent protection (chaps) that will protect the vulnerable areas of the legs.

Employees shall wear no less than a short-sleeved shirt and long pants. Full-length FR rated clothing covering the upper body must be worn when trimming near energized lines.

Footwear should be a substantial reinforced toe work boot. Other types of footwear, such as low shoes, tennis shoes, sandals, etc., are not acceptable.

Caulks or other suitable footwear, which will afford reasonable protection from slipping, shall be worn while working on logs, poles, pilings, or similar forest products.

When gloves are worn, they should **NOT** have flared cuffs.

CLIMBING

Before the first climb of the day, all climbing equipment shall be inspected. Damaged equipment shall not be used.

Each climber shall use a nylon web saddle issued by the District.

Each climber shall carry a safety strap approved or issued by the District whenever working aloft.

A safety strap shall not be used in place of a climbing line except in trees in which a good crotch is not available.

A Figure 8 knot shall be tied in the tail of the climber's line between the snap and the point at which the taut line between the snap and the point at which the taut line hitch is tied. This will readily identify the piece to be cut should a climber have to be rescued from a tree.

The rope shall be coiled as it is pulled from each tree to prevent tangling or dragging on the ground.

When riding a climbing line out of a tree, keep the speed of descent low so better control is maintained.

The climber shall be familiar with the characteristics of the tree to be climbed and be fully aware of the position of all conductors and wires in relation to the tree and the work position.

The crotch to be used should be selected from the ground before the climber is in the tree. Never crotchin over conductors or where the climber will be closer than six (six) feet on descent.

The Climb

A long shinny shall be avoided wherever possible. Use a ladder, a safety strap or a rope.

Dead limbs shall be avoided wherever possible.

A secondary hold shall always be maintained as a means of preventing a fall should a slip or unexpected break in a branch occur.

Weight shall always be placed on a branch as close to the leader coming from the truck as possible.

The climbers shall continually check their position in relation to the conductors.

The pole saw and pole chip shall be hung securely.

Climbers shall not climb or work from utility poles.

Climbers shall not stand on, lay ladders against, or otherwise touch telephone cables, messengers, and utility poles, roofs of garages, porches, or houses.

Working from the top of the truck (including the cab guard screen on a lift truck) is expressly prohibited. This does not apply to carrying out equipment inspection and maintenance procedures.

All tools shall be raised and lowered with a hand line from the tree.

Climber's Line

The climber's line shall be used before any trimming is started, whether on the tree or from a short ladder; the climber must be properly tied in!

The climber's line must be a minimum of 1/2 inch Dacron rope and used strictly for this purpose.

The crotch selected for tying in shall be directly over the work area as practical, but never close enough to violate the minimum working clearance required.

The rope shall be crouched around a leader, not a branch growing from it. Double crotching may be necessary in special situations to support the climber's weight.

Crotch to a leader, other than the one being worked on, whenever practical.

The climber's line should be placed in an open crotch, in preference to a tight crotch.

The end of a climber's line shall be kept clear of all traffic.

The **TAUT LINE HITCH** kept in the climber's line must be properly made. Two (2) turns over two (2) shall always be used.

The climbing line must be more than twice as long as the crotch is high.

In wet, freezing weather, special care shall be used to keep climbing line free of snow and ice.

The climber's line shall be used to help distribute the weight of the climber slack in the climbing line to avoid injury caused by a sharp jerk.

A climber shall never be pulled into a tree.

TRIMMING

Before causing a branch or wood to fall, the climber shall make sure it's clear below.

Before starting to fall or buck any tree or snag, the cutter shall survey the area for any hazards and proceed according to safe standards.

If branches are being dropped on the roadway, a flagger shall be used to control traffic when necessary.

If a branch should get on the conductors, it shall not be touched. A dry rope or insulated tool shall be used to remove it. A branch that is being cut by the climber shall not be allowed to touch the wires.

A branch shall always be cut back to a size that can be safely handled. A rope shall be used to support and guide the branch if there is any question about the ability of the climber or bucket operator to keep control.

Branches being roped out of a tree shall be rigged so that no violent or unexpected motion will result.

Tree Felling/Bucking/Limbing

Before beginning any felling operation, the tree and the surrounding area must be checked for things like decay or rot in the trunk, objects that could catch the tree, and the shape, balance, and lean of the tree.

Employees shall not approach a faller within reach of the trees being felled unless a signal has been given or acknowledged by the faller that it is safe to approach.

All fallers and buckers shall have with them in near proximity at all times, an ax, a minimum of two (2) wedges, and a first aid kit.

Wind Force and Direction

At no time shall fallers work if wind is strong enough to prevent the falling of trees in the desired direction or if vision is impaired.

Where it will fall. Special attention shall be given to the proximity of electric conductors. Whenever the tree could possibly reach a conductor when it falls, it shall be topped or cut back so that it cannot contact it, or a rope shall be used.

If a rope is used, those handling the rope on the ground shall be stationed well beyond the possible reach of the tree at least a distance equal to one and one-half (1-1/2) times the height of the tree.

The major leader trees shall be felled individually.

Prior to any cuts being started by the saw operator, the crew lead person shall establish that the saw operator has a clear unobstructed **ESCAPE PATH** which shall be used as soon as the tree or snag is committed to fall, roll or slide.

Be sure each crew member knows what to do. Those not directly involved shall be kept in the clear.

The public shall be kept clear of the operation (a distance equal to at least twice the height of the tree).

Before Starting the Undercut

Give an audible warning.

Make the notch exactly in the intended direction of the fall.

The depth of the undercut shall be about one third of the diameter of the tree.

The opening of the undercut shall be about three and one half (3-1/2) inches for each foot of diameter of the tree.

Making the Back Cut, or Finish Cut

Before starting the back cut give an audible warning.

The cut shall be several inches higher than the undercut so that the tree will not kick back when falling.

Cut evenly! Don't cut through holding wood on one side before the other unless you intend to.

If the tree tends to settle on the saw, wedge it up with a wedge (never with an ax or other hard steel tool), being careful so that the saw does not strike any section of the wedge during this operation.

Before the back cut is completed, stop and make a last visual check to be certain everyone is in the clear.

Just before the tree starts to fall, give another audible warning that each crew member will understand.

Turn off saw and get clear of the tree.

If the saw binds in the cut or is dropped, leave it and get to safety. Watch for flying limbs and limbs which may be knocked from adjacent or nearby trees.

"Ripping" or "slicing" trees over (no notch and proper undercut) is specifically prohibited.

When practical, stand on the side opposite from the limb being cut and on the uphill side of the work.

Have good solid footing free of tripping hazards.

Don't cut limbs that are propping on logs, unless the probability of the shift of the log can be controlled.

Always anticipate the probability of movement of the wood when cut.

Work on uphill side, whenever practical; if necessary, block the tree to prevent it from rolling.

To prevent the saw from binding, slope the cut so that the log drop will open the cut, block it up or use a soft or wood wedge to hold the cut open.

Use a cant hook to roll large logs.

TREE-TRIMMING SAFETY EQUIPMENT

Chippers Operation

When the chipper is running, the operator and all others involved in the chipping operation shall wear eye protection and hearing protection within twenty-five (25) feet of the chipper.

Gauntlet-type gloves and loose clothing shall not be worn by a chipper operator.

Small pieces of brush or wood shall be pushed through the chipper with a stick or branch, never by using your hands, feet, a rake, or pruner pole.

The chipper shall always be fed from the back corner, or side of the feed table never from directly behind the center portion of the feed table. As the brush or wood is taken into the blades, the operator shall immediately turn away from the feed table to avoid being struck by whipping branches.

No part of the body shall ever be placed on the feed table while the chipper is running.

All persons shall be kept clear of the exhaust chute when the chipper is running.

The engine, particularly the manifold and exhaust area, shall be kept free of chips and sawdust to prevent fire.

When there is a fire hazard, do not operate the equipment in high, dry weeds or grass without first clearing this growth from the motor and exhaust area.

The chipper ignition shall be locked and the key removed whenever the unit is left unattended.

A chipper shall never be operated without proper belt guards in place.

Under no circumstances shall any part of the body be placed under the belt guards unless the unit is fully stopped with the motor at rest.

A trailer chipper shall not be hitched or unhitched from a truck without sufficient help.

Before any trailer chipper is towed on a public roadway, the hitch safety chain and electrical connections shall be properly attached with the chain crossed under the tow bar.

A parked, unhitched trailer chipper shall have both main wheels blocked or chocked to prevent rolling.

A load of chips shall not be left in the truck for more than two (2) days to prevent setting them afire by spontaneous combustion.

The chipper operator shall not work under a tree which is being trimmed.

No one shall ride or carry equipment on the feed table or any other part of the chipper when moving the equipment.

TREE-TRIMMING SAFETY WORKING SAFELY WITH TOOLS

Ladders

Only ladders issued by the District shall be used and said ladder shall be inspected prior to each use. (See *Ladder* Section in Accident Prevention Manual.)

Ropes

The ropes used by tree trimmers are bought especially for tree work. No other ropes shall be used.

Ropes are issued in two sizes: 1/2 inch and 5/8 inch. The 1/2 inch shall be used either as a climbing line or hand line but is not interchangeable!

The 5/8 inch polyester rope is used as a bull rope for heavy rigging. (See *Rope Strength Data* section in Accident Prevention Manual.)

Each Climber Will Have and Use Their Own Climbing Rope

In no case shall a hand line ever be used as a climber's line.

Climbing lines shall not be used to raise or lower tools.

Ropes shall be regularly inspected, which includes each day prior to use for:

- 1. Breaks or cuts in outside fibers.
- 2. Excessive wear, with particular attention to the tail and replaced if damaged.
- 3. The inside fibers of the rope should be reasonably bright and clean. If they are dull and dirty looking, the rope should be replaced.

The climber's line shall be equipped with a safety snap issued by the District, secured by a bowline.

Ropes shall be coiled for storage.

Ropes shall not be stored or brought in contact with sharp-edged tools, equipment or any other objects or material that might damage them.

Ropes shall be kept clean.

Kinks shall be "turned" out of a rope - not pulled or stretched out.

Climbing ropes shall be turned end for end on the snap at least once each week to evenly distribute wear.

AERIAL LIFT EQUIPMENT

See Man lift section of Accident Prevention Manual.

TREE-TRIMMING SAFETY TREE TOP RESCUE & BUCKET RESCUE

Rescue Techniques

Rescuer alerts rest of crew that an emergency exists.

Rescuer designates one (1) crew member to go for help. (Radio, telephone - do not use victim's name on radio if possible.)

Clear victim from hazard if necessary. Do not become a second victim!

Rescuer's position should be alongside and slightly above victim if possible.

Determine victim's condition:

- 1. Shake and shout, "Are you all right?"
- 2. Open airway and look, listen, and feel for breathing.
- 3. If not breathing, give two full slow breaths of air.
- 4. Check for pulse.

Proceed for conditions indicated to lower victim from structure.

- 1. Unconscious, not breathing, no pulse speed critical.
- 2. Unconscious, not breathing, has pulse speed important.
- 3. Unconscious, is breathing, has pulse speed important.
- 4. Conscious but injured or ill; rig and assist to level ground. Be prepared for the possibility the person may lose consciousness.

Note: Proceed with steps 5 through 11 below for the conditions above.

- 5. Position lifeline in tree above injured person if possible.
- 6. Rig injured person with lifeline.
- 7. Remove the slack from lifeline; the person on the ground takes up the slack.
- 8. Take a firm grip on the fall line.
- 9. After rigging, give the injured person two (2) more breaths of air if not breathing.
- 10. Cut line between line hitch and Figure 8 knot. Clip and cut taut line hitch so that it will not hang up in a crotch.
- 11. Lower the injured person, guiding them past anything on the way down. The employee on the ground can control the rate of descent by turning the rope around object on the ground.
- 12. If injured person is conscious follow procedures 7 through 10, except feed enough slack in line to allow climbing freedom and assist down the structure.
- 13. Do not leave the injured person alone, even if they say they are all right. IMPORTANT!
- 14. Aerial lift equipment may be used if it is immediately available.

- 15. If the person is seriously injured or unconscious and in aerial lift equipment, follow steps 1 through 2. Then the crew member on the ground should lower the bucket to a location and extract the injured person and follow step 5.
- 16. Because the injured person(s) might be unable to operate the aerial lift equipment, all crew members shall be familiar with aerial lift controls and location of release valves and shall be able to operate controls to bring the aerial lift equipment to a point where the injured person(s) may be removed, then follow step 5 and administer the appropriate first aid.



This section provides additional requirements and related work practices for power generation plants.

Interlocks and other safety devices shall be maintained in a safe, operable condition.

No interlock or other safety device may be modified to defeat its function, except for test, repair, or adjustment of the device.

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

The following rules shall not apply to the use of existing electrical installations during their lifetime. Provided they are maintained in good condition and in accordance with the applicable safety factor requirements and rules in effect at the time they were installed, and that reconstruction shall conform to the rules as herein provided.

Sufficient access and working space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment.

Guidelines for the dimensions of access and workspace about electric equipment in generating stations are contained in National Electrical Safety Code (NESC) and ANSI C2-2012. An installation that does not conform to this standard will, nonetheless, be considered as complying with this section if the District can demonstrate that the installation provides ready and safe access based on the following evidence:

- 1. That the installation conforms to the edition of ANSI C2 that was in effect at the time the installation was made;
- 2. That the configuration of the installation enables employees to maintain the minimum approach distances required by this section while they work on exposed, energized parts; and
- 3. That the precautions taken when work is performed on the installation provide protection equivalent to the protection that would be provided by access and working space meeting the ANSI C2-2012.

GUARDING OF ROOMS CONTAINING ELECTRIC SUPPLY EQUIPMENT

Rooms and spaces in which electric supply lines or equipment are installed shall meet the requirements of this section under the following conditions:

- 1. If exposed live parts operating at 50 to 150 volts to ground are located within eight (8) feet of the ground or other working surface inside the room or space;
- 2. If live parts operating at 151 to 600 volts and located within eight (8) feet of the ground or other working surface inside the room or space are guarded only by location, as permitted under this section; or

- 3. If live parts operating at more than 600 volts are located within the room or space; unless:
 - a) The live parts are enclosed within grounded, metal-enclosed equipment whose only openings are designed so that foreign objects inserted in these openings will be deflected from energized parts; or
 - b) The live parts are installed at a height above ground and any other working surface that provides protection at the voltage to which they are energized corresponding to the protection provided by an eight-(8) foot height at 50 volts.

The rooms and spaces shall be so enclosed within fences, screens, partitions, or walls as to minimize the possibility that unqualified persons will enter.

Signs warning unqualified persons to keep out shall be displayed at entrances to the rooms and spaces.

Entrances to rooms and spaces that are not under the observation of an attendant shall be kept locked.

Unqualified persons may not enter the rooms or spaces while the electric supply lines or equipment is energized.

GUARDING OF ENERGIZED PARTS

Guards shall be provided around all live parts operating at more than 150 volts to ground without an insulating covering, unless the location of the live parts gives sufficient horizontal or vertical or a combination of these clearances to minimize the possibility of accidental employee contact unless;

- 1. Each employee is isolated from energized parts at the point of closest approach; and
- 2. Precautions taken when work is performed on the installation provide protection equivalent to the protection that would be provided by horizontal and vertical clearances meeting ANSI C2-2012.

Except for fuse replacement or other necessary access by qualified electrical persons, the guarding of energized parts within a compartment shall be maintained during operation and maintenance functions to prevent accidental contact with energized parts and to prevent tools or other equipment from being dropped on energized parts.

When guards are removed from energized equipment, barriers shall be installed around the work area to prevent employees who are not working on the equipment, but who are in the area, from contacting the exposed live parts.

HYDRO PLANTS AND EQUIPMENT

Employees working on or close to water gates, valves, intakes, fore-bays, flumes, or other locations where increased or decreased water flow or levels may pose a significant hazard shall be warned and shall vacate such dangerous areas before water flow changes are made.

TESTING AND TEST FACILITIES

This section provides for safe work practices for high-voltage and high-power testing performed in laboratories, shops, and substations, and in the field and on electric transmission and distribution lines and equipment. It applies only to testing involving interim measurements utilizing high voltage, high

power, or combinations of both, and not to testing involving continuous measurements as in routine metering, relaying, and normal line work.

Routine inspection and maintenance measurements made by qualified electrical employees are considered routine work and are not included in the scope of this section, as long as the hazards related to the use of intrinsic high-voltage or high-power sources require only the normal precautions associated with routine operation and maintenance work required in the other subsections of this section. Two typical examples of such excluded test work procedures are "phasing-out" testing and testing for a "no-voltage" condition.

The District shall establish and enforce safe work practices for the protection of each worker from the hazards of high-voltage or high-power testing at all test areas, temporary and permanent. Such work practices shall include, as a minimum, test area guarding, grounding, and the safe use of measuring and control circuits. A means for providing for periodic safety checks of field test areas shall also be included.

Employees shall be trained in safe work practices upon their initial assignment to the test area, with periodic reviews and updates provided as required by subsections of this section.

Permanent test areas shall be guarded by walls, fences, or barriers designed to keep employees out of the test areas.

In-field testing, or at a temporary test site where permanent fences and gates are not provided, one of the following means shall be used to prevent unauthorized employees from entering:

- 1. The test area shall be guarded by the use of distinctively colored safety tape that is supported approximately waist high and to which safety signs are attached; or
- 2. The test area shall be guarded by a barrier or barricade that limits access to the test area to a degree equivalent, physically and visually, to the barricade specified in this section; or
- 3. The test area shall be guarded by one or more test observers stationed so that the entire area can be monitored.

The barriers required by this section shall be removed when the protection they provide is no longer needed.

Guarding shall be provided within test areas to control access to equipment or apparatus that may become energized as part of the testing by either direct or inductive coupling, in order to prevent accidental employee contact with energized parts.

The District shall establish and implement safe grounding practices for the test facility.

All conductive parts accessible to the test operator during the time the equipment is operating at high voltage shall be maintained at ground potential except for portions of the equipment that are isolated from the test operator by guarding.

Wherever ungrounded terminals of test equipment or apparatus under test may be present, they shall be treated as energized until determined by tests to be de-energized.

Visible grounds shall be applied, either automatically or manually with properly insulated tools, to the high-voltage circuits after they are de-energized and before work is performed on the circuit or item or apparatus under test. Common ground connections shall be solidly connected to the test equipment and the apparatus under test.

In high-power testing, an isolated ground-return conductor system shall be provided so that no intentional passage of current, with its attendant voltage rise, can occur in the ground grid or in the earth. However, an isolated ground-return conductor need not be provided if the District can demonstrate that both the following conditions are met:

- An isolated ground-return conductor cannot be provided due to the distance of the test site from the electric energy source; and
- Employees are protected from any hazardous step and touch potentials that may develop during the test.

In tests in which grounding of test equipment by means of the equipment grounding conductor located in the equipment power cord cannot be used due to increased hazards to test personnel or the prevention of satisfactory measurements, a ground that the District can demonstrate affords equivalent safety shall be provided, and the safety ground shall be clearly indicated in the test set up.

When the test area is entered after equipment is de-energized, a ground shall be placed on the high-voltage terminal and any other exposed terminals.

High capacitance equipment or apparatus shall be discharged through a resistor rated for the available energy.

A direct ground shall be applied to the exposed terminals when the stored energy drops to a level at which it is safe to do so.

If a test trailer or test vehicle is used in field testing, its chassis shall be grounded. Protection against hazardous touch potentials with respect to the vehicle, instrument panels, and other conductive parts accessible to employees shall be provided by bonding, insulation, or isolation.

Control wiring, meter connections, test leads and cables may not be run from a test area unless they are contained in a grounded metallic sheath and terminated in a grounded metallic enclosure or unless other precautions are taken that the District can demonstrate as ensuring equivalent safety.

Meters and other instruments with accessible terminals or parts shall be isolated from test personnel to protect against hazards arising from such terminals and parts becoming energized during testing. If this isolation is provided by locating test equipment in metal compartments with viewing windows, interlocks shall be provided to interrupt the power supply if the compartment cover is opened.

The routing and connections of temporary wiring shall be made secure against damage, accidental interruptions and other hazards. To the maximum extent possible, signal, control, ground, and power cables shall be kept separate.

If employees will be present in the test area during testing, an observer shall be present. The test observer shall be capable of implementing the immediate de-energizing of test circuits for safety purposes.

SAFETY CHECK

Safety practices governing employee work at temporary or field test areas shall provide for a routine check of such test areas for safety at the beginning of each series of tests.

The test operator in charge shall conduct these routine safety checks before each series of tests and shall verify at least the following conditions:

- Barriers and guards are in workable condition and properly placed to isolate hazardous areas;
- System test status signals, if used, are in operable condition;
- Test power disconnects are clearly marked and readily available in an emergency;
- Ground connections are clearly identifiable;
- Personal protective equipment is provided and used;
- Signal, ground, and power cables are properly separated

PERSONAL FLOTATION DEVICES - WAC 296-800-16070

Provide and make sure your employees wear personal flotation devices (PFD).

- When they work in areas where the danger of drowning exists, such as:
 - \circ On the water.
 - Over the water.
 - Alongside the water.

Note: Employees are not exposed to the danger of drowning when:

- Employees are working behind standard height and strength guardrails.
- Employees are working inside operating cabs or stations that eliminate the possibility of accidentally falling into the water.
- Employees are wearing an approved safety belt with a lifeline attached that prevents the possibility of accidentally falling into the water.

- Provide your employees with PFDs approved by the United States Coast Guard for use on commercial or merchant vessels. The following are appropriate or allowable United States Coast Guard-approved PFDs:
 - Type I: Off-shore life jacket Effective for all waters or where rescue may be delayed.
 - Type III: Flotation aid Good for calm, inland water, or where there is a good chance of rescue.
 - Type V: Flotation aids such as boardsailing vests, deck suits, work vests and inflatable PFDs marked for commercial use.
- Inspect PFDs before and after each use for defects and make sure that defective PFDs are not used.
- Provide approved life rings with an attached line on all docks, walkways, and fixed installations on or adjacent to water more than five (5) feet deep.
- Life rings must:
 - Be United States Coast Guard approved thirty (30) inch size.
 - Have attached lines that are at least ninety (90) feet in length.
 - Have attached lines at least one quarter (1/4) inch in diameter.
 - Have attached lines with a minimum breaking strength of 500 pounds.
 - Be spaced no more than two-hundred (200) feet apart.
 - Be kept in easily visible and readily accessible locations.
- Life rings and attached lines must:
 - Be maintained to retain at least seventy-five (75) percent of their designed buoyancy and strength.
 - Be provided in the immediate vicinity when employees are assigned work at other casual locations where the risk of drowning exists.
 - Work assigned over water where the vertical drop from an accidental fall would be more than fifty (50) feet, must be subject to specific procedures as approved by the department.

WORKPLACE VIOLENCE PREVENTION PROGRAM

Purpose

To provide guidance to employees and their managers on dealing with workplace violence in order to ensure a safe work environment for all employees. Because each situation is different, workplace violence must be dealt with according to the individual facts and circumstances of the situation. Refer to Directive 93, *Workplace Violence Prevention* for more information.

Responsibilities

All employees are encouraged to be alert and/or aware of violent types of conduct in the workplace and report any concerns or potentially dangerous situations.

Access to District property will be as follows:

- Access to the District's property may be limited based on a business need.
- All employees and employee vehicles on District property must display company identification, including District parking decals and identification badges. Contractors must comply with District badge protocol.
- All visitors must register and display identification while on District property.
- Visitors must be escorted in restricted areas.

While we do not expect employees to be skilled at identifying potentially dangerous persons, employees are expected to exercise good judgment and to inform his/her supervisor if an employee or visitor exhibits behavior which could be a sign of a potentially dangerous situation. Such behavior includes but is not limited to:

- Bringing weapons to the workplace
- Discussing using weapons with intent to harm
- Displaying overt signs of extreme stress, resentment, hostility or anger
- Making threatening remarks
- Sudden or significant deterioration of performance/behavior
- Displaying irrational or inappropriate behavior

In a crisis situation where danger is imminent, get to a safe place and call 911 immediately. Then, if able, immediately call the Security Operations Center (SOC) at 425-783-8787 (or extension 8787 from office phones). This phone number is on the back of employee badges. The SOC will immediately contact the necessary emergency personnel.

Employees are encouraged to utilize Run, Hide, Fight methods in active shooter situations. The Run, Hide, Fight video is on the Security page on Sno web and is also taught in the Preventing Workplace Violence class, and in safety meetings.

The components of Run, Hide, Fight are:

RUN

- Have an escape plan
- Evacuate
- Leave your belongings
- Help others if possible

HIDE

- Be out of the shooter's view
- Lock doors and block them with furniture
- Keep your options for movement
- Silence your phone
- Be quiet

FIGHT (only as a last resort)

- Act aggressively
- Incapacitate the active shooter
- Throw objects
- Yell and call for help

Additionally, any employee who observes and/or experiences threatening behavior while on the job is expected to immediately notify his/her supervisor, Employee Resources, or the Security Operations Center. In situations where employees are threatened and/or assaulted by customers, the employee should contact his/her supervisor who will contact the Manager of Security Services and Business Continuity or the Security Operations Center.

If the complaint involves the employee's immediate supervisor, the employee should contact the Employee Resources Director or his/her designee.

Threats, threatening conduct, or any other act of aggression or violence in the workplace will not be tolerated. Any employee determined to have committed such acts will be subject to disciplinary action, up to and including termination.

Note: Refer ALL media inquiries to the Communications, Marketing & Business Readiness Director.

Training

Workplace Violence Prevention is a core training class at the District. Core training classes include those classes in which all employees are required to participate within the first twelve (12) months of employment.

Managers are responsible for ongoing, job-specific workplace violence prevention instruction and security control measures for their specific areas of responsibility.

WORKPLACE VIOLENCE

WORKPLACE VIOLENCE RESOURCES

Security

Doug Williams, Security Manager 425-783-8770 Security Operations Center (SOC) 425-783-8787 (Open 24 hours per day/7 days a week)

Employee Resources Staff

Sharon Reijonen 425-783-8633 Sara Kurtz 425-783-4634 Or contact the Employee Resources Front Desk x8655 to be connected with someone that can assist

Employee Assistance Program

Wellspring Family Services 1-800-553-7798 Provides counseling services for PUD employees and family members

If Danger is Imminent or Life Threating

In the office or in the field

- 1. Get to a safe place
- 2. Call 911
- 3. Notify the Security Operations Center (SOC) to assist in coordination of emergency services.

Reporting a Potential Concern (if danger is not imminent)

1. Notify your manager or Employee Resources

OR

2. Call the Security Operations Center at 425-783-8787 if security coordination is needed.

BOMB THREATS, BUILDING EVACUATION PROCEDURES & SUSPICIOUS PACKAGES/LETTERS

BOMB THREAT RECEIVED BY PHONE

Get as much information as possible

If you receive the call, stay calm. As you document what the caller is saying, try to get the attention of a manager or coworker and alert them of the caller. Once it is confirmed that the call is a bomb threat, the manager/coworker needs to contact the Energy Control Center (ECC) at x5040 and report the information and follow bomb threat evacuation procedures in this section.

Stay on the phone and ask these questions:

□ When will the bomb explode?							
Where is the bomb right now?							
□ What kind of bomb is it?							
□ What does it look like?							
□ Why are you doing this?							
□ Where are you calling from?							
□ The time and date threat was received:							
□ How the call was received:							
Caller's voice:							
□ Male □ Female □ Young □ Middle Age □ Old □ Accent							
Is voice familiar? Yes INO If YES, who did it sound like?							
Other voice characteristics:							
Time caller hung up:Remarks:							

Your name, department and telephone #:

DO NOT USE A CELL PHONE OR RADIO TO CALL ECC BECAUSE THIS COULD DETONATE A BOMB!

ECC will contact 911 if not already contacted and make other notifications as required.

BUILDING EVACUATION PROCEDURES

- Evacuate the building immediately when you hear the fire alarm; or when you are notified by a manager, floor warden, security officer, or other authority.
- If you are told to evacuate and the fire alarm has not been activated, find the nearest fire alarm pull station and pull the alarm (unless you have been instructed not to do so).
- Take personal items with you (coats, umbrellas, purses, and keys) as you may not be able to return to the building.
- Look around as you evacuate and report anything suspicious to your floor warden.
- Do not touch any suspicious items.
- Use stairways, not elevators. (Stay calm, walk don't run.)
- Follow instructions as you exit. You could be routed around any suspected or known bomb location.
- Assist others needing help.
- Leave the building by the nearest exit (unless otherwise directed) and report to your designated evacuation assembly zone. Be aware of arriving emergency vehicles.
- Remain in the evacuation assembly zone until you receive further instructions. Do not move your car from parking area until directed.
- Do not re-enter the building for any reason until Command Post Managers or their assignees have given permission.

WHAT DO I DO IF I RECEIVE A SUSPICIOUS PACKAGE THAT MAY CONTAIN EXPLOSIVES OR DANGEROUS SUBSTANCES?

- Leave the letter or package alone. Do not move the item.
- Leave the vicinity immediately and direct anyone nearby to do the same.
- Contact the Energy Control Center (ECC) at x5040 and explain the situation.
- If an unknown substance is found but the employee is not aware of a threat, contact the ECC. The ECC will contact Safety and Security to provide assistance.
- Individuals who open or have contact with a letter or package containing an unknown substance should thoroughly wash their hands with soap and water. If the substance gets on your clothes, remove, and shower with soap and water. Wash clothes in soap and water.
- Names of anyone who may have been exposed should be collected immediately. Individuals will be contacted with results if tests are conducted.

- For chemical threats or suspected explosive devices, ECC will contact 911 and make other necessary notifications. The Health Department will respond based on a request from law enforcement only.
- If a threat of a chemical exposure is determined by law enforcement at the scene, they will advise the District on steps to follow.
- Results of the Health Department test will be available in time to determine what, if any, treatment should be implemented.
- There is no need to start antibiotics prior to the analysis of the letter or package.

If the package is considered a possible bomb threat, follow the bomb threat procedure while waiting for law enforcement to arrive.

What are the characteristics of a suspicious package?

The likelihood of receiving a package or letter containing explosives or suspicious substances is remote. However, it is important for employees to be aware of common characteristics of suspicious packages. Some indicators include, but are not limited to:

- * Mailed from a foreign country
- * Excessive postage * Misspelled words

* Restrictive markings

* Badly typed or handwritten

- * No return address
- * Addressed to title only
- * Wrong title with name
- * Rigid or bulky

- * Strange odor * Lopsided/protruding item
- * Stains on wrapping