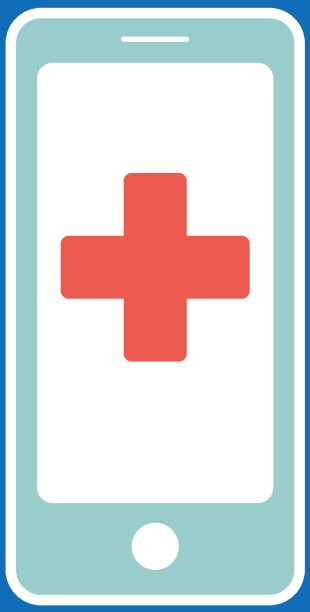
Safety Manual

June 2018

Revised August 2018

PGE



24/7
Work Injury Nurse Line

844-228-2037

Receive immediate medical advice for minor workplace injuries

- **Call** at the first sign of pain
- **Talk** with a registered nurse who will evaluate your injury
- **Get** connected to the care you need

For life threatening/emergency situations, call 911 or activate emergency medical services for your location.

Safety Rules to Live By

1. Wear appropriate arc flash personal protective equipment (PPE).
2. Follow all electrical safety testing and grounding rules.
3. Follow approachable working clearance/cover rules.
4. Follow all fall protection rules.
5. Follow all lockout-tagout (LOTO) rules and procedures.
6. Follow confined space and enclosed space entry requirements.

Important Contact Numbers

Key Contact	Number
24/7 Work Injury Nurse Line	1-844-228-2037
Corporate Communications	503-464-8949
Corporate Security	503-464-8600
Dolphin (SDS system)	1-800-275-6737 503-303-6503
DP Nicoli – Trenching and Shoring	503-692-6080
Environmental and Licensing Services	503-464-8970
Facilities (after hours)	503-464-8196
Facilities (work hours)	503-416-3940
Generation Control Rooms	
Beaver	503-728-7251/ 7252
Biglow	541-442-5901
Boardman	541-481-1251
Carty	541-481-1350
Coyote Springs	541-481-8348
Pelton	541-325-5301
Port Westward	503-728-7470
Tucannon	503-464-2088
West Side Hydro (Faraday)	503-630-8364

Key Contact	Number
IT Service Desk	503-464-8250
Life Flight	800-232-0911
OSHA Oregon	503-378-3272
OSHA 300 Log	503-464-7302
PGE Nurses	503-464-7286/ 7269
PGE Safety & Resiliency	503-464-7302
Planning, Scheduling and Dispatch	503-612-6100
Repair and Restoration	503-736-5661
Spill Crew (call System Control Dispatch)	503-464-8343
System Control Center Dispatch	503-464-8343
System Control Center Emergency	503-464-8343
System Control Center Generation	503-464-8650
WTC Operator	503-464-8000, “4” for operator
WTC Security Emergency Non-emergency	 503-464-2888 503-464-8196

Dear co-workers:

We do dangerous work, sometimes in challenging conditions. The safety of everyone — our employees, contractors, customers and the communities we serve — is our highest priority and a core value.

Anyone injured at work or injured coming in contact with our equipment impacts all of us. It is essential that we take the time to work safely and speak up should we see something or have concerns or questions. It's about making sure we are there for each other and for our loved ones.

A key element of achieving a safe workplace is this Safety Manual, which provides a common set of safety expectations for all of us. Whether you work in the field or in an office, the Safety Manual is an important document. Safety is a team effort, and it is imperative that we each understand the proper procedures and practices, doing our part to ensure a safe and injury-free work place.

Please take the time to study the Safety Manual and learn the proper safety practices and procedures that apply to your work. Failure to comply with our safety rules and procedures will result in formal coaching and discipline, up to termination. Please don't hesitate to ask for clarification if you are unsure about the safe work practices for any job or task you are given.

No job is so important that we can't take time to do it safely.

Injuries are preventable. Thank you for your dedication to safety, your commitment to our shared values and for doing your part to get PGE to zero injuries.

Maria Pope
President and CEO

Manual Revisions

Date Revised	What Changed	Reason for Change
December 2017	Revised Safety Responsibilities on Page 2: Replaced heading of "Foremen/Crew Leads" with "Employee in Charge (e.g., Supervisor, Foreman, Crew Lead)".	Aligning language with regulatory description of who on crew is responsible for conducting pre-job briefing.
	Revised Section 1200 E) – Pre-Job Briefings/ Tailboards: Now reads "Employee in charge shall conduct a pre-job briefing/tailboard with employees involved with the job."	Aligning language with regulatory requirement.
June 2018	Revised Sections 102, 103 and 1302 – 24/7 Work Injury Nurse Line.	Directs employees that calling is a requirement for non-life-threatening injuries.
	Updated Section 706 – Untreated Sewage – Safe Work Practices.	Providing clarity of safe work practices when exposure to untreated sewage occurs.
	Revised Section 901 – Office Environment: Clarified what outside items are not allowed to be brought to work.	Previous language did not clearly define what items were not to be brought to work.
	Revised Section 1001 – General Ladder Safety.	Directs employees that portable ladders shall be inspected annually by a competent person.

Date Revised	What Changed	Reason for Change
	Revised Section 2201 – Arc Flash Safety Program.	Clarifying exception for requirement of safety glasses when conducting certain tasks in substation.
	Revised Section 3700 – Personal Protective Equipment (PPE): Defines PPE that is allowed on PGE property.	Clarifying that only PPE provided by PGE or approved through the PPE reimbursement program is allowed.
	Revised Section 3700 – Personal Protective Equipment (PPE).	Clarifying exceptions for safety glasses when conducting certain work tasks in substations.
	Revised Section 3704 – Head Protection: Included actions to take to ensure integrity of an individual's hard hat (e.g., how to conduct a field test).	Previous language in manual did not give clear direction as to when a hard hat or its suspension system were required to be changed out.
	Added Section 3708 – PPE Requirements for Storeroom and Transformer Shop Operations.	Providing guidance for warehousing operations for required PPE when performing certain work tasks.
	Revised Section 3710 – Rubber Protective Equipment: Now includes more detailed direction for inspection and time lines for testing of rubber protective equipment beyond what was included previously.	Expanding language in Section 3710 to include all rubber protective equipment.

Date Revised	What Changed	Reason for Change
August 2018	Added Section 1113 – Safe Transport of Employees.	Improved safe work practices.
	Definitions section in Appendix: Revised note under definition of Qualified Person (for Generation, Transmission and Distribution).	Providing clarity regarding qualified person definition.

Preface

Welcome to your PGE Safety Manual. Whether you work in the field or at a desk, we hope you find this manual meaningful, relevant and easy to use. You will find:

- Important safety contacts and phone numbers are listed in the front section of the manual.
- Safety topics are organized alphabetically within three major sections.
- The first major section consolidates Emergency Plans/Procedures and First Aid guidelines, including actions to take when faced with medical, fire, vehicle incidents or earthquake emergencies.
- The second Companywide section contains broad safety guidelines relevant to most employees.
- The Field Operations section contains safety guidelines geared primarily to operating units such as T&D, Generation and Meter Services employees.
- An index of key topics is at the end.

As regulations, technology and work processes change, this manual will continue to evolve. PGE is committed to updating its contents to ensure it remains as current as possible. If in doubt about a particular rule, be sure to refer to the electronic version posted on myPGE. The electronic version will be kept up to date between printings.

If you find an error in the manual or have a suggestion for a new or revised safety rule, submit your idea by following the steps described in the Safety Manual Revision Process section on Page 6.

NOTE: Throughout the manual, we refer to several Oregon regulatory departments, such as Oregon OSHA and ODOT. Because we now also conduct business in Washington state, it can be inferred from these references that we also expect compliance with Washington regulatory rules and laws where they apply.

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Safety Responsibilities

Safety and health are a personal responsibility and a corporate commitment. Nothing is more paramount in our daily activities than incorporating safe practices into everything we do. Working safely is not a choice. It is a personal commitment, an obligation and the responsibility of all employees. Safety begins and ends with each of us.

One of the greatest challenges to safety is distractions. Cell phones, co-workers' conversations, vehicle traffic, the presence of customers on a jobsite — distractions can come in many forms and have the potential to divert our attention and create an unsafe work environment. Try to recognize when workplace distractions are present and take measures to control or eliminate them. If they can't be immediately controlled, stop work until you are sure you can focus on your job and perform safely.

The following responsibilities are in accordance with PGE Safety and Health Policy:

Employees

1. Understand and follow PGE's Safety Rules to Live By as described inside the cover of this manual, as well as applicable safety and health rules, practices and work procedures.

2. Perform only work activities for which you have been trained and are authorized to do. Speak up if you have inadequate knowledge, skills or training to perform a job safely.

3. Immediately stop any unsafe activity for others or yourself.

4. Immediately report unsafe or hazardous working conditions, as well as any incident, near miss, injury or illness to your

foreman and/or supervisor. (*See Section 1300 — Safety Incident Reporting*.) ***A near miss is defined*** as any event that could have, under slightly different circumstances, caused injury, illness, death, property damage, loss of materials or environmental damage.

5. Properly use, inspect and maintain Personal Protective Equipment (PPE), e.g., hard hats, safety glasses, hearing protection), flame-resistant (FR) apparel, fall protection, safety equipment and tools to ensure safe operating conditions so that the work is performed safely.

6. Actively participate in pre-job briefings/tailboard to familiarize yourself with hazards and confirm your immediate role and the roles of others.

7. Exercise reasonable judgment and work in a manner so as not to create a safety or health hazard to yourself or others.

8. Proactively identify hazards and unsafe practices; evaluate each situation for imminent threat of injury, death or property damage and take appropriate action.

9. Take action to prevent injuries and/or incidents through emphasis on prevention, preparedness and response to hazards; initiate improvements to get the job done safely and take an active role in implementing changes.

10. Actively participate in required training.

11. Ensure work areas are kept in a clean and orderly manner. Store all materials and tools appropriately. Properly maintain areas where employee or public access is required.

12. Cooperate with any investigation by PGE or an authorized governmental agency of an alleged unsafe work practice or condition.

13. Failure to adhere to the expectations in the Safety Manual may result in discipline up to and including termination.

Employee in Charge (e.g., Supervisor, Foreman, Crew Lead)

1. Work safely as described above in the employees' responsibilities.

2. Perform and document pre-job briefings/tailboard.

3. Communicate hazard mitigation and required safety procedures, and encourage crew members to identify hazards and provide suggestions.

4. Ensure appropriate tools and safety equipment are available.

5. Routinely observe crew activities for safe work practices and donning of appropriate PPE and FR apparel. Ensure employees have and properly use appropriate PPE.

6. Hold employees accountable for working safely and consistently and fairly enforce all safety and health rules.

7. Effectively communicate to employees their responsibility to report all injuries, property damage and near misses immediately. (*See Section 1300 — Safety Incident Reporting*.)

8. Stop any work practices that are unsafe and ensure safety rules are followed, which may include, but is not limited to removing employees from the work if they will not work safely.

9. Follow up on safety concerns through resolution.

10. Ensure work sites/areas are kept free of hazards to both employees and members of the public.

Supervisors

1. Work safely as described above in the employee responsibilities section, and provide a safe and healthy work environment for employees.
2. Understand and support PGE's safety and health policies, programs, procedures and culture applicable to your work unit.
3. Take an active role in ensuring compliance with safety rules, which may include but is not limited to removing employees from the work if they will not work safely.
4. Develop strategies to integrate safety into business plans and operations.
5. Participate in safety meetings and safety training sessions.
6. Ensure your employees are properly trained to safely conduct assigned work.
7. Encourage employees to proactively identify hazards, provide suggestions and participate in addressing safety and health issues.
8. Follow up on safety concerns through resolution.
9. Conduct site visits, risk assessments and crew observations.
10. Recognize safe work practices and successes.
11. Hold foremen and employees accountable for working safely and consistently and fairly enforce all safety and health rules.

12. Ensure employees have and properly use appropriate PPE.

13. Ensure all injuries, incidents, near misses and property damage are reported immediately and analyzed in a timely manner. (*See Section 1300 — Safety Incident Reporting*.)

14. Ensure work locations and jobsites are maintained for the safety of employees and the public.

Managers/Directors

1. Work safely as described above in the employee and supervisor responsibilities' sections, and provide a safe and healthy work environment for employees.

2. Provide visible leadership to all employees within the organization by promoting safety and health compliance while focusing on prevention. Develop strategies to integrate safety into business plans and operations.

3. Create a work culture that encourages employees to proactively identify hazards, provide suggestions and participate in addressing safety and health issues.

4. Follow up on safety concerns through resolution.

5. Recognize safe work practices and successes.

6. Hold supervisors and employees accountable for working safely and consistently, and fairly enforce all safety and health rules.

7. Conduct risk assessments and implement control processes to mitigate risks.

8. Ensure management tools (e.g., reviews, coaching, recognition and discipline) are in place to measure and promote safety and performance.

Officers

1. Work safely as described above in the employee, supervisor and manager/director responsibilities' sections, and provide a safe and healthy work environment for all employees.
2. Hold managers/directors accountable for working safely and consistently, and fairly enforce all safety and health rules.
3. Provide visible leadership by setting the tone and expectations to foster a safe and healthy culture at PGE.
4. Provide oversight for the implementation of PGE's Safety and Health Policy, programs and practices.

Safety Manual Revision Process

Any PGE employee, safety team, or organization may propose revisions to PGE's *Safety Manual*. Ultimate approval of any revision is the responsibility of the Executive Safety Council. Proposed revisions that are found to have merit by the council will be incorporated into the Safety Manual by PGE Safety & Resiliency.

The procedure for proposing revisions is as follows:

1. To submit proposed revisions, you can either complete the form on Page 9 and send it to PGE Safety & Resiliency (see instructions on form), fill out Form 5089 on the Forms web page or use this link to submit your suggestion electronically: https://www.surveymonkey.com/r/Safety_Manual_Feedback.

2. Proposed revisions that represent changes or additions to safety rules will be initially evaluated by PGE Safety & Resiliency using the following criteria:

    a) Is the proposed revision covered anywhere else in the manual?

    b) Is it consistent with business policies/procedures?

    c) Is it consistent with Oregon or Washington regulatory requirements as applicable?

    d) Is it consistent with generally accepted safe work practices?

3. Proposed changes that are then approved by the council will be incorporated into the electronic version of the Safety Manual located on the PGE Safety portal, and, if the change is significant enough, rule changes will be communicated in a special Safety Bulletin from PGE Safety & Resiliency and become effective with the date on the bulletin.

4. If you would like us to follow up with you about your submission, please leave your name and a note that you would like to be contacted in Box 4.

SAFETY MANUAL FEEDBACK FORM

1. For what section(s) of the Safety Manual are you suggesting a change?

SECTION
SUBSECTION
PAGE NO.

2. How can the current content be improved? (Check all that apply.)

- ☐ Content is incorrect.
- ☐ Content is incomplete.
- ☐ Content can be better explained/better aligned with my work practices.
- ☐ Content would benefit from an explanatory photo or diagram.
- ☐ Content would benefit from a table of information.
- ☐ Other (please specify).

3. Describe your idea or suggested correction:

4. (Optional) Please provide your contact information if you wish to be contacted or in case we have questions or need clarification related to your suggestion. Thank you!

Mail to PGE Safety & Resiliency, 1WTC0607

PGE 5089 (h) Rev. 5/22/18

Emergency Plan/Procedures and First Aid

100 Emergency Plan and Procedures

101 Emergency Preparedness and Evacuation

A) Emergency Action Plan:

1) An Emergency Action Plan has been developed for the site where you work and includes:

a) Evacuation procedures specifying types of evacuation and exit routes.

b) Procedures to account for all employees after evacuation.

c) Procedures for reporting a fire or other emergency.

d) Procedures to follow for emergency operation or shut down of critical equipment before evacuation.

e) Procedures to follow for rescue and medical duties.

f) Names or job titles of employees to contact for more information about the duties of employees under the plan.

g) Procedures to alert employees.

h) Designated employees to assist in the safe evacuation of other employees.

2) It is everyone's responsibility to review their organization's Emergency Action Plan and be prepared for potential emergency situations.

   a) Know your emergency role:

      i) Familiarize yourself with all emergency plans and procedures for your work area so you can respond effectively during an emergency.

      ii) Know the safe way to evacuate the building you work in.

3) During an emergency, follow these evacuation procedures:

   a) Stay calm and follow the instruction of Emergency Coordinators or Floor Leaders.

   b) Go to the nearest emergency exit.

   c) Use stairs, never elevators.

   d) Each PGE site has a designated assembly area outside – know your location.

   e) More detailed procedures are listed in this section for specific emergencies and locations.

B) For additional information on emergency preparedness, see PGE's Business Continuity Emergency Management Emergency Procedures portal page at myPGE > Our Company > Departments > Human Resources, Diversity & Inclusion > Corporate Resiliency > Business Continuity & Emergency Management.

102 Medical Emergencies

A) First-aid/CPR response:

1) For life-threatening medical emergencies, immediately follow the steps below to activate emergency medical services (EMS) as appropriate for your work group.

2) ***If you are qualified*** or can locate someone who is, begin administering first aid and/or cardiopulmonary resuscitation (CPR).

3) If needed, access an automated external defibrillator (AED) for ***a qualified person*** to use on the patient. AEDs are provided at each worksite.

B) At ***WTC*** – follow these steps to report a medical emergency:

1) Call 911 from a desk phone, if possible. Be prepared to provide the patient's age, gender and symptoms, your location (including address, floor and suite number) and call-back information. Direct the medical team to the main lobby of the building you are in.

2) Call Security at 503-464-2888.

a) Security will hold an elevator ready for the medical team.

b) A Security officer will be dispatched to your location with a first-aid kit and AED.

c) Security officers will direct EMS responders to your location.

C) If at a ***generating plant*** – follow these steps to report a medical emergency:

1) Notify the Control Room of the medical emergency using a plant radio, phone, or plant intercom, as available.

2) Provide the following information: location, type of injury/illness, who is injured/how many are injured, what support is required and call-back information.

D) If ***working out in the field*** (e.g., line crews, sub ops, meter services, etc.) – follow these steps to report a medical emergency:

1) Radio reporting procedures:

a) For truck radios, in order for the emergency button to work, the radio ***must*** be on one of the regional repeated radio bands (green, red, silver or yellow, Channels 1–4, on your radio). The radio must ***not*** be in talk-around mode.

NOTE: If you hit the emergency button on accident, press the button a second time (at least two seconds) to turn the emergency alarm off, or you can power cycle the radio.

b) For portable radios, press the orange emergency button to activate an emergency alert.

c) When your call is acknowledged by the System Control Center, speak slowly and clearly to relate:

   i) The exact location of the emergency, including county and nearest cross street.

   ii) The nature of the incident.

   iii) The patient's age, gender and symptoms (remember not to use an employee's name on the radio).

   iv) The type of assistance needed.

d) Use standard three-way voice communication to confirm all information has been received and is correct.

e) Post one person to lead EMS responders to the injured person.

f) To cancel the emergency alert, press the emergency button for at least two seconds. Then radio the System Control Center to confirm the cancellation.

2) ***Telephone reporting procedures***. If the radio is not operational or System Control Center does not respond to the emergency alert, follow telephone reporting procedures.

   a) Call 911 directly.

   b) Speak slowly and clearly to relate:

      i) Your name and the number from which you are calling.

ii) The exact location of the incident, including county and nearest cross street.

iii) The nature of incident.

iv) The patient's age, gender and symptoms (remember not to use an employee's name).

v) The type of assistance needed.

c) Post one person to lead EMS responders to the person in distress.

d) After EMS has been activated by the 911 dispatcher, call the System Control Center (503-464-8343) to report the incident.

E) ***For all other locations*** – follow these steps to report a medical emergency:

1) Call 911 directly.

2) Speak slowly and clearly to relate:

a) Your name and the number from which you are calling.

b) The exact location of the incident, including county and nearest cross street.

c) The nature of incident.

d) The patient's age, gender and symptoms (remember not to use the employee's name).

e) The type of assistance needed.

3) Post one person to lead EMS responders to the person in distress.

4) After EMS has been activated by the 911 dispatcher, call the System Control Center (503-464-8343) to report the incident.

F) These procedures apply whether the emergency involves an employee or a member of the public.

G) For a non-life-threatening workplace injury/illness, employees ***must*** contact the 24/7 Work Injury Nurse Line (844-228-2037) for medical advice. If immediate off-site medical care is needed, arrange to be transported to a medical care provider. **DO NOT** drive yourself.

103 Activating Emergency Medical Services

A) Response requirements for employee electrical contact:

An electrical contact is defined as any current flow through or across an employee's body. In all cases where an electrical contact is made to a known high voltage or a known secondary voltage where the employee was unable to let go of a circuit or equipment, the employee will be transported by ambulance to the nearest emergency room. Likewise, we will follow the same procedure on any electrical contact on a known or unknown voltage (e.g., induction, backfeed) when any of the following occur:

NOTE: All incidents of electrical contact above 48 volts should be reported to your supervisor.

1) Burns or wounds

2) Interrupted or impaired breathing

3) The employee is/was unable to let go of a circuit or equipment

4) Any neurological problems, including but not limited to:

   a) Tremors

   b) Shaking

   c) Numbness

   d) Difficulty balancing

   e) Difficulty walking

   f) Confusion

   g) Disorientation

   h) Speech difficulties

   i) Vision problems

   j) Bladder problems

   k) Headache

5) Pain lasting greater than five minutes

NOTE: **DO NOT** transport employee; initiate medical services in accordance with *Section 102 — Medical Emergencies.*

B) Employee guidelines for other incidents that may require medical attention:

1) **DO NOT** transport employee to hospital. In the event of any of the following situations, initiate medical services in accordance with *Section 102 — Medical Emergencies*:

a) Chest pain, pressure, signs and symptoms of heart attack

b) Shortness of breath; breathing difficulty

c) Altered level of consciousness or unconsciousness

d) Severe abdominal pain

e) Fracture of major bone (not a finger, etc.) or dislocation

f) Serious bleeding

g) Shock

h) Serious motor vehicle accident

i) Significant trauma to head, neck, chest or abdomen

j) Snake or multiple animal bites

k) Chemical burns especially to the eyes

l) Inhalation/ingestion of chemicals or fumes

m) Puncture wound to chest or lung

n) Hydraulic fluid injection

o) Heat stroke or hypothermia

C) For a non-life-threatening workplace injury/illness, employees ***must*** contact the 24/7 Work Injury Nurse Line for medical advice. If immediate off-site medical care is needed, arrange to be transported to a medical care provider. **DO NOT** drive yourself.

D) For personal medical events of less severe nature:

1) Contact advice nurse through insurance provider (Providence RN, Kaiser, Regence).

2) Contact personal medical provider.

3) Contact family/friend to transport to doctor or urgent care.

104 Activating Life Flight

A) During work hours, if a PGE employee is seriously injured or has a life-threatening medical emergency at a PGE ***generating plant*** or ***in the field***/remote location, Life Flight may be activated by calling Life Flight dispatch at 1-800-232-0911.

Note: Life Flight can be activated for any primary electrical contact regardless of time saved.

B) In case of life-threatening emergencies at PGE offices or within metropolitan areas, activate EMS in accordance with your work location procedures. First responders will determine the appropriateness of activating Life Flight. Plan for 30 minutes of transport time.

C) Life Flight needs a landing zone of approximately 100 feet by 100 feet, free of wires, obstructions and debris, and as level as possible.

D) **DO NOT** approach the helicopter; Life Flight personnel will approach you.

E) The flight nurse or paramedic may request help with loading the patient.

F) The Direct Dispatch Agreement PGE has with Life Flight does not apply to members of the public. In the event a public citizen has a life-threatening emergency, activate EMS according to your work group procedures.

NOTE: Life Flight does not perform rescue response. Local fire department personnel will generally provide rescue.

105 Fire Emergencies

A) If you hear the fire alarm:

1) Stay calm and quiet so everyone can hear emergency evacuation instructions.
2) Close but **DO NOT** lock doors.
3) Walk quickly; **DO NOT** run or push.
4) Prepare to exit; take only essential belongings with you.
5) Feel doors with the back of your hand before opening them. **DO NOT** open if hot to the touch.

6) Remove shoes that will slow the evacuation, such as high heels.

7) Use handrails on the right side of the stairwells; leave the left side of the stairwell open to allow room for firefighters coming up the stairs.

8) Assist slower moving persons.

9) Make sure all stairwell doors are closed after the last person evacuates the floor.

10) Follow the direction of floor leaders and report to your designated assembly area after evacuation.

11) At the designated assembly area, your manager, supervisor or a floor leader will conduct a headcount. Immediately report any missing co-workers and provide information on their location, if known.

12) If you work in a multistoried building:

    a) **DO NOT** use elevators to exit the building. In most buildings, elevators will automatically recall to the ground floor.

    b) Proceed down the stairs to your designated relocation floor or exit the building.

    c) **DO NOT** leave designated assembly area until a headcount has been conducted.

d) Listen for instructions from fire personnel or the emergency response team.

NOTE: If the floors above are evacuating and the floor you are on is not affected by smoke or fire, move back onto the floor until the upper floors have evacuated.

13) If you are disabled:

a) Allow all individuals not requiring special assistance to evacuate the floor first, before you move into the stairwell or your designated evacuation area.

b) Leave wheelchairs behind when evacuating into the stairwell. At WTC, Evacu-Trac equipment is located in several stairwell locations.

c) Await help from your assigned aide, if needed, to traverse stairs.

d) Aides should alert a floor leader when disabled persons are waiting for assistance to evacuate.

14) If you are trapped:

a) Keep the door shut and seal the crack under it with a cloth.

b) Follow the steps below for reporting a fire, as appropriate for your work group.

B) If you discover a fire:

1) Assist anyone in danger.

2) Confine the fire by closing doors.

3) Pull the fire alarm (if available).

C) If at ***WTC*** – follow these steps to report a fire:

1) Call WTC Security at 503-464-2888. Provide details about the fire's location, what is on fire, approximate size of fire and whether any employees are trapped or injured.

a) WTC Security will call 911 and coordinate fire emergency response.

b) A WTC Security officer will be dispatched to your location.

c) A WTC Security officer will be posted at a plaza level elevator to direct fire personnel.

d) A WTC Security officer will greet fire personnel on the plaza to accompany them to the correct building (1, 2 or 3WTC)

2) While one person is calling WTC Security, another should alert a floor leader and follow their instructions.

D) If at a ***generating plant*** – follow these steps to report a fire:

1) Notify the Control Room using a plant radio, phone, or plant intercom, as available.

2) Provide the following information: location of fire, description of what is on fire, approximate size of the fire and whether there are any injuries.

E) If ***working out in the field*** (e.g., line crews) – follow these steps to report a fire:

1) Radio reporting procedures:

a) For truck radios, in order for the emergency button to work, the radio ***must*** be on one of the regional repeated radio bands (green, red, silver or yellow, Channels 1–4, on your radio). The radio must ***not*** be in talk-around mode.

NOTE: If you hit the emergency button on accident, press the button a second time (at least two seconds) to turn the emergency alarm off, or you can power cycle the radio.

b) For portable radios, press the orange emergency button to activate an emergency alert.

c) When your call is acknowledged by the System Control Center, speak slowly and clearly to relate the exact location and nature of the fire (and whether anyone is trapped or injured), including county and nearest cross street.

d) Use standard three-way voice communication to confirm all information has been received and is correct.

e) To cancel the emergency alert, press the emergency button for at least two seconds or turn the radio off and then back on. Then radio the System Control Center to confirm the cancellation.

f) If the radio is not operational or the System Control Center does not respond to the emergency alert, follow telephone reporting procedures.

2) Telephone reporting procedures:

a) Call 911 directly.

b) When your call is acknowledged by the 911 Dispatcher, speak slowly and clearly to give the name and number from which you are calling, the exact location and nature of the fire (and whether anyone is trapped or injured), including county and nearest cross street.

c) After emergency services have been activated by the 911 dispatcher, call the System Control Center (503-464-8343) to report the fire.

d) Post one person to lead emergency responders to the location, if not obvious.

F) For ***all other locations*** – follow these steps to report a fire:

1) Call 911 directly.

2) When your call is acknowledged by the 911 Dispatcher, speak slowly and clearly to give the name and number from which you are calling, the exact location and nature of the fire (and whether anyone is trapped or injured), including county and nearest cross street.

3) After emergency services have been activated by the 911 dispatcher, call the System Control Center (503-464-8343) to report the fire.

4) Post one person to lead emergency responders to the location, if not obvious.

106 Post-Emergency Checklist

A) Below is a checklist to activities in the immediate aftermath of any emergency (e.g., fire, flood, earthquake, terrorist attack, etc.). Priorities immediately following an emergency are life safety, stabilization of the incident or situation and communications.

1) Assess yourself for injuries and collect your thoughts to stabilize yourself. Evaluate the possibility of subsequent threats, such as aftershocks, building collapse, smoke inhalation, etc.

2) Assess co-workers for injuries/fatalities and administer aid or call for assistance as needed.

3) Assess the need to evacuate or shelter-in-place based on the situation and take action. Take communications devices and emergency kit(s) if possible.

4) Conduct staff accountability procedures at assembly area/muster locations and report to the authority having jurisdiction.

5) Assess communications capabilities and contact family or others as needed.

6) Assess the situation and report details to the appropriate authority.

7) Be aware of surrounding area and maintain situational awareness. Be cautious of traffic, unstable hazards above and around you and stay alert for emerging hazards.

200 Basic First Aid

201 CPR and AEDs

A) Only trained employees holding current certification cards may administer first aid, CPR or use an AED. PGE offers classes through myLearning.

B) If an AED has been used in a rescue, it must be turned over to your supervisor or safety coordinator. **DO NOT** attempt to reset an AED as it may contain valuable patient information.

202 Bloodborne Pathogens (BBP)

A) Employees who can reasonably expect to come into contact with human blood or other potentially infectious material are required to wear the following PPE:

1) Disposable gloves.
2) Protective eye/face shields.
3) CPR masks or barrier shields with one-way valves.

B) Employees who come in contact with blood or other potentially infectious body fluids are required to notify their supervisor or a PGE nurse immediately.

1) Follow the instructions available in the *Bloodborne Pathogen Exposure Packet* located on the myPGE Forms page.

C) For detailed information concerning PGE's *Bloodborne Pathogen Exposure Control Plan*, visit Our Company > Our Commitments > Safety on the company intranet.

203 Burns

A) Identifying burns:

1) Surface burns are usually accompanied by redness, pain and swelling.

2) Deep burns are usually indicated by blisters, deep tissue destruction and a charred appearance.

B) First aid – burns:

1) Stop the burn: Put out flames or remove the victim from the source of the burn.

2) Cool the burn: Run or pour cool water over the burn, immersing if possible. Cool until pain is reduced.

3) Cover the burn: Use dry, sterile dressing and a bandage.

4) Keep the victim as comfortable as possible; prevent him or her from becoming chilled or overheated.

5) Flush chemical burns with large amounts of water until medical personnel arrive.

6) For electrical burns, make sure power is turned off before touching the victim.

7) If the burn is serious, call for medical help by following the emergency procedures for your work group.

204 Electric Shock

A) Contact with electrified conductors or equipment can produce an electric shock strong enough to knock a person unconscious, even stopping the heart and breathing.

B) First aid – electric shock:

1) Call for medical help by following the emergency procedures for your work group.

2) TURN OFF THE POWER SOURCE. **DO NOT** approach the victim until power has been turned off. If the power source cannot be located, secure the area.

3) **DO NOT** move the victim unless there is immediate danger.

4) If you are qualified, administer rescue breathing or CPR as necessary.

5) If the victim is conscious, treat for shock.

6) Check for other injuries and monitor the victim until medical help arrives.

205 First-Aid Kits

A) PGE provides first-aid supplies in readily accessible containers throughout the company.

1) Kits are inspected quarterly or at least annually.

2) Opened, depleted or expired items should be replaced as needed.

3) Order supplies for first-aid kits from the storeroom.

B) Employees should know the locations and contents of first-aid kits in their areas.

C) Kits in company vehicles are to be inspected after each use or at least annually.

300 First Aid – Environmental Hazards

301 Heat Stress/Heat Stroke

A) Recognizing symptoms of heat stress and heat stroke is important because it is your body's way of telling you to get out of the heat. Heat stress symptoms can also indicate other health problems.

B) Symptoms of heat stress that could indicate a serious problem:

1) Dizziness
2) Rapid heartbeat
3) Nausea
4) Cramps
5) Headache
6) Excessive sweating
7) Chest pain
8) Breathing problems
9) Extreme weakness
10) Diarrhea

C) Signs of heat stroke:

1) High body temperature
2) Hot, red, dry skin
3) Rapid pulse

D) Treatment of heat stress/heat stroke:

1) If you suspect that someone has heat stroke, activate the emergency medical procedures appropriate for your work group. Any delay seeking medical help can be fatal.

2) While waiting for paramedics to arrive, initiate first aid. Move the person to an air-conditioned environment, if possible, or a cool, shady area and remove unnecessary clothing.

3) If possible, take the person's core body temperature and provide first aid to cool it below 102^{o} F. If a thermometer is unavailable, don't hesitate to provide first aid. Try these cooling strategies:

a) Fan air over the person while wetting his/her skin with water.

b) Apply ice packs to the person's neck, back, armpits and groin. Because these areas have a lot of blood vessels, cooling them can circulate cooler blood throughout the body's core.

c) Immerse the person in a shower or tub of cool water, or an ice bath.

302 Hypothermia and Frostbite Treatment

A) Symptoms:

1) Hypothermia: Intense shivering, poor articulation, impaired judgment, lack of coordination ("mumbles and stumbles"), "leave me alone" attitude.

2) Frostbite: At first, pain. Then cold tissue that is pale (early stages), white or deep purple, accompanied by loss of sensation.

B) Treatment of hypothermia:

1) Mild hypothermia:

a) Prevent further heat loss. Go to a warmer environment, if possible, or find shelter and insulate the victim from the ground.

b) Put on dry clothing, if needed, and cover the head.

c) Offer warm caffeine-free liquids when shivering has stopped. Offer food.

d) Offer heat if the victim cannot get warmer – heated water bottles, heat packs, another body.

2) Severe hypothermia:

a) Seek medical help immediately.

b) Take steps to stabilize the victim, as noted above, but beware that the victim is in a delicate condition.

c) Limit the victim's movement; moving large muscle groups can cause heart arrhythmia and be fatal.

C) Treatment of frostbite:

1) Remove constrictive clothing, boots, etc.

2) NEVER RUB FROSTBITTEN TISSUE: This worsens potential damage.

3) If possible, rewarm in a warm water bath (100-108° F) until tissue is soft and pliable and no further color changes occur – usually 30-60 minutes.

4) If warm water is unavailable and frostbite is minor, place frostbitten hands under armpits, frostbitten feet directly on the abdomen of a friend, etc.

5) If frostbite is severe, seek medical treatment immediately.

6) Thaw tissue in the field only if tissue can be prevented from refreezing.

7) Expect some pain, depending on the severity of the injury. Administer pain medication while tissue is frozen; repeat every four to six hours.

303 Poisonous Plants

A) It is important to know the characteristics of poisonous plants.

1) Poison oak is a woody shrub or vine with “leaves of three,” meaning groups of three leaflets, along its branches. In spring and summer, its leaves are shiny; in the fall, its leaves often turn red before dropping. Its bare stems can be reddish color in winter. The irritating oils in the plant (urushiol) can be found in the leaves, stems and roots.



2) Poison sumac contains between seven and 13 leaflets per leaf cluster. It grows in standing water in the form of a small tree or a shrub. One way to identify it is by the location of its fruit. The fruit is found between the leaf and the branch, as opposed to the end of the branch.

B) Preventing exposure:

1) Identify the plants around you.

2) Wear long sleeves, pants and gloves when you think you may risk exposure.

3) Obtain protective barrier cream from the PGE storeroom.

4) If not already required for the job, consider wearing safety glasses.

5) Wash contaminated clothes and tools separately from other articles.

C) If exposed:

1) Wash the area with cold, soapy water or use the poison oak cleanser available from PGE

storerooms. **DO NOT** use hot water, as this can spread the irritating oils.

2) Change your clothes and shoes as soon as possible, being careful how you remove them. Consider protecting your hands with rubber gloves.

3) Place clothing directly in a laundry machine or a plastic bag until laundering can be done.

4) Clean leather boots with rags and isopropyl alcohol (wear gloves).

5) Report the exposure to your supervisor.

D) Treatment:

1) Exposed skin usually develops an itchy, burning rash of red streaks or patches that may include swelling and blisters that “weep” or crust over. Symptoms may last one to two weeks. If you develop a reaction, try the following tips. Be sure to complete a *Safety Incident Report* and submit through mySafety.

a) Use plain calamine lotion to help soothe the itch.

b) Apply cold, wet compresses to reduce itching and inflammation.

c) Keep the area clean after blisters have broken.

d) Don’t scratch! Scratching can lead to an infection.

e) Use caution if you use an antihistamine to reduce itching. Some cause drowsiness. **DO**

NOT drive or perform hazardous work if you are drowsy.

f) Consult a doctor if necessary, or contact a PGE nurse for more information.

400 First Aid – Animal/Insect Bites and Stings

A) Report all animal/insect bites and stings by completing and submitting a *Safety Incident Report* through mySafety.

401 Bee and Wasp Stings

A) Employees allergic to bee/wasp stings:

1) PGE encourages but does not require employees to tell their co-workers about allergies so they are aware what actions need to be taken if you are stung.

a) A person with allergies should have an epinephrine injector ("Epi-Pen") available all times. These injectors are prescribed by an individual's health care provider.

b) Show your co-workers how to use it in case you need assistance.

2) After a sting, use your injector according to your health care provider's instructions.

3) Follow emergency medical procedures as applicable for your work group.

B) Employees not allergic to bee/wasp stings:

1) Watch for the following symptoms after being stung:

a) Shortness of breath.

b) Numbness or itching in the roof of the mouth or redness/swelling in the face.

c) Dizziness or hives anywhere on the body.

2) Any of these symptoms could mean an allergic reaction. If observed, follow emergency procedures as applicable for your work group.

3) Localized swelling will occur after a sting, even if you are not allergic.

4) Treatment:

a) Try to remove the stinger using a scraping motion. **DO NOT** squeeze the stinger with fingers or forceps, as you will release more toxins.

b) Wash with soap and water. Apply a cold pack, ice pack or cold water. Topical soothing wipes are available in company first-aid kits.

c) If you are stung on a finger and the swelling goes past the second joint, contact your supervisor and seek medical attention, if needed.

d) Antihistamines can help with itching, hives and other minor allergic reactions, but can cause drowsiness. **DO NOT** drive or perform hazardous work when drowsy.

C) After the immediate symptoms are treated, watch for signs of infection (e.g., increased redness, swelling, pain or drainage). See your health care provider if any of these symptoms develop.

402 Dog, Cat, Other Animal Bite Treatment

A) Dog bites:

1) If you are bitten by a dog:

a) Try to stay calm.

b) Seek a secure area away from the dog.

c) Dog bites that **DO NOT** involve a digit (fingers or toes) or face may be cleansed thoroughly with soap and water and observed for signs of infection. If the bite involves a digit, there are multiple puncture wounds, or you have not had a tetanus shot within the past five years, seek medical attention.

d) Animal bites must be reported to the county in which they occurred. Reporting may be done by the employee, supervisor, or attending medical provider. Often the medical treatment facility will facilitate the notification to animal control.

i) Share with animal control everything you know about the dog, including the owner's name and the address.

ii) If the dog is a stray, provide animal control with details like: what the dog looks like, where you saw it, whether you've seen it before and in which direction it went.

B) Cat bites:

1) Because of the high risk of infection, cat bites MUST be treated as soon as possible by a

personal health care or urgent care provider. If there are no other alternatives, go to a hospital emergency department.

a) Cleanse the wound(s) thoroughly with soap and water immediately after being bitten.

b) **DO NOT** apply any topical ointments or creams.

c) **DO NOT** wait for signs of infection to appear before seeking treatment.

C) Other animal bites:

1) For animal bites from animals other than dogs or cats (e.g., squirrel, bat, rat, pig, etc.):

a) If severe, seek medical attention.

b) Even if minor, contact the local county health or emergency department to determine if immediate treatment is required.

c) All animal bites must be reported to the county in which they occurred. Reporting may be done by the employee, a supervisor, or an attending medical provider.

D) Poisonous snakes:

1) Note the snake's appearance. Be ready to describe the snake to emergency personnel.

2) Protect the victim while waiting for medical help:

a) Move the victim beyond striking distance of the snake, if still present.

b) Have the person lie down with the wound below the heart.

c) Keep the person still to keep venom from spreading.

d) Cover the wound with loose, sterile bandages.

3) **DO NOT**:

a) Cut a bite wound.

b) Attempt to suck out venom.

c) Apply a tourniquet, ice or water.

d) Provide the victim water or caffeinated drinks.

NOTE: On the east side of the Cascades, hospitals often have antivenom serum in stock. If you live or work east of the Cascades, it would be a good precaution to research which hospitals in your area have this serum on hand.

E) Spider bites:

1) Black widow:

a) Although serious, a black widow bite is rarely lethal. You can identify this spider by the red hourglass marking on its belly.

b) The bite feels like a pinprick. You may not even know you've been bitten.

c) At first you may notice slight swelling and faint red marks. Within a few hours, though, intense pain and stiffness begin.

d) Other signs and symptoms include:

i) Chills

ii) Fever

iii) Nausea and vomiting

iv) Severe abdominal pain

2) Brown recluse:

a) You can identify this spider by the violin-shaped marking on its back.

b) The bite produces a mild stinging sensation followed by local redness and intense pain within eight hours. A fluid-filled blister forms at the site and then sloughs off to leave a deep, enlarged ulcer.

c) Reactions from a brown recluse spider bite vary from a mild fever and rash to nausea and listlessness. Deaths from brown recluse bites are rare; children are at greater risk.

3) If bitten by a black widow or brown recluse spider:

a) Cleanse the wound and skin around it with soap and water.

b) Slow the venom's spread:

i) If the spider bite is on an arm or a leg, tie a snug bandage above the bite and elevate the limb to help slow or halt the venom's spread.

ii) Ensure that the bandage is not so tight that it cuts off circulation.

c) Use a cold cloth compress at the bite location.

d) Seek immediate medical attention:

i) Treatment for black widow bites may require antivenom medication.

ii) Brown recluse spider bites can be treated with various medications.

403 Mosquito Bites

A) West Nile Virus (WNV) is transmitted to humans by mosquitos; however the chances for WNV infection are low. The Centers for Disease Control (CDC) estimates that about one in five people infected will develop a fever and other symptoms, or secondary infections such as encephalitis, which is rare. Though the possibilities for contracting WNV are low, it is extremely important to take precautions to avoid mosquito bites.

B) To avoid mosquito bites:

1) Apply insect repellent containing DEET (diethyltoluamide) when you will be working outdoors. Choose a repellent that provides protection for the amount of time that you will be outdoors. Note that products containing more than

50 percent DEET **DO NOT** increase the duration of protection.

a) Products containing 23.8 percent DEET provide about five hours of protection.

b) Products containing 20 percent DEET provide almost four hours of protection.

c) Products containing 6.65 percent DEET provide nearly two hours of protection.

d) Wear long-sleeved clothes and long pants treated with repellents. Mosquitoes can bite through thin clothing. If you spray your clothing, you **DO NOT** need to spray repellent on your skin under your clothing.

e) **DO NOT** spray DEET on FR clothing or rubber gloves, as this degrades their effectiveness.

2) Be aware that dawn and early evening are peak mosquito-biting times.

3) Also, be aware when working around water (rivers, streams, lakes, holding ponds or any kind of standing water).

404 Tick Bites

A) Ticks are the leading carriers (vectors) of diseases to humans in the United States, second only to mosquitoes worldwide. In most circumstances, it is not the tick bite but the toxins, secretions, or organisms in the tick's saliva transmitted through the bite that causes disease.

B) To avoid tick bites do the following:

1) Whenever possible, avoid grassy areas and shrubs where ticks may be lying in wait to tag a ride on a potential "meal."
2) Wear light-colored clothing so ticks can be easily seen and brushed off.
3) Tuck pants into boots or socks.
4) Apply insect repellant, specifically the brands designed to repel ticks. Follow label instructions.

C) When a tick bites, it attaches itself firmly to the skin. To remove it:

1) Grasp it close to the skin with tweezers or a tick removal tool.
2) Pull straight up with a steady, slow motion.
3) If portions of the tick remain in the skin, seek further medical attention.
4) **DO NOT** use fingernail polish, petroleum jelly, a glowing hot match, or alcohol to remove a tick. These actions have no proven value and may cause additional problems.

Companywide

500 Ergonomics

501 Introduction to Ergonomics

A) Ergonomics focuses on the relationship between the worker, the task and the environment. Ergonomic principles are used to prevent soft tissue injuries (cumulative trauma disorder, repetitive strain injury) that are often the accumulations of several smaller strains over a long period of time. Consider three basic overall objectives:

1) Fit the task to the person – not the person to the task.

2) Work smarter – seek processes and equipment that reduce the potential for injury and may improve efficiency.

3) Make tasks user-friendly – develop work procedures that help keep the body in neutral positions.

502 Basic Ergonomic Principles

A) Work in neutral positions. Working in awkward and contorted positions increases stress on the body and potential for injury.

B) Minimize static work postures and the need to use excessive force, which can overload muscles, causing fatigue and injury.

C) Keep the workplace organized and place frequently used items in easy reach. Long reaches cause twisting, bending and strain that may lead to injuries.

D) Work at proper heights. Generally work is best done at elbow height whether sitting or standing.

E) Reduce excessive motion, which can cause injury to sensitive tissue and joints.

F) Minimize pressure points. Direct pressure or "contact stress" in addition to being uncomfortable can cause nerve damage and inhibit blood flow.

G) Provide adequate work space for any task and proper clearance to ensure easy access to necessary items.

H) Take periodic minibreaks to stretch affected parts of the body and rest eyes. Move, exercise and stretch often to increase blood flow to muscles and tendons.

I) Maintain a comfortable environment by controlling lighting and temperature as much as possible.

J) Make displays and controls understandable. “Keep it simple” to reduce errors.

K) Always use proper tools for the job being performed.

503 Office Ergonomic Guidelines

A) Workstation design can have a big impact on employees' health and well-being. If set up incorrectly, a workstation can cause problems with the neck, shoulders and back.

B) Computer workstation setup – sitting or standing:

1) The goal is to maintain your body in a relaxed, neutral position with neck, shoulders and back relaxed. To accomplish this, follow these ergonomic guidelines:

a) Place the keyboard directly in front of you, bend your elbows at a right angle and close to your body, with forearms and hands in a straight line. Type with gentle touch. A keyboard tray may be used if desk level is not adjustable.

b) Locate mouse/trackball at the same level and immediately next to the keyboard. Keep a light and relaxed grip on the mouse or trackball and take breaks for gentle hand stretches every 30 minutes. Move the mouse/trackball close to the keyboard, with arm close to the body. Vary mouse/trackball placement right/left side of the keyboard.

c) If your desk is adjustable, vary between seated and standing positions. Alternate often to reduce strain on the back. Use a foot rest for varied positions.

d) Consult your chair manual, if possible and adjust the chair to:

e) Keep feet flat on the floor (adjust seat height)

f) Keep hips level and slightly higher than knees

g) Provide a seat depth that allows about 2 inches between the front of the seat and

back of your knee, while fully supporting your back.

h) Keep frequently used items close to the body and in the green zone to avoid unnecessary reaching.

i) Use an antifatigue mat when standing.

j) Place monitor(s) directly in front of you, arms' length from eyes and as low as comfortable for the proper reading angle (approximately 30 degrees below horizontal). Pay attention to monitor height and placement in relation to head and neck posture.

k) Place monitor(s) at a right angle to outside windows or other bright light sources to minimize glare, reflections and eye strain.

l) Clean your monitor screen, mouse/trackball and keyboard on a regular basis.

2) Workstation accessories:

a) Use a document holder when working from source documents and locate it at same height and distance as the monitor screen.

b) Use a headset if you use the phone frequently, have long conversations, or participate in online meetings.

C) Office injury prevention strategies:

1) Take regular (mini) breaks at least every hour to reduce static work postures and repetitive activity. Move around, get up from the chair and perform back and neck, arm and leg stretches.

2) Stretch hands and shoulders in ways that are different from the static positions caused by using the mouse and keyboard.

3) Take hourly vision breaks to reduce eye strain, especially when working at a computer. Let your eyes look away from the monitor screen and refocus on distant objects, such as reading text on distant signs/printed material or outside views.

4) Keep space under your desk (“legroom”) free from boxes, bags, trash cans and other items that can be stored elsewhere.

5) Consider using a headset when talking on phone while you write, type or do any other activity. Shoulder rests on phone receivers should be removed as they put a neck in an uncomfortable and awkward position.

6) Keep frequently used items within close reach of your desk or work area. Place items in your office according to how often they are used, with least used items farther away.

7) Maintain heavy binders and books at lower levels to avoid reaching above shoulder height. If not used frequently, store them away from your desk to take a natural stretch break when retrieving them.

8) Keep your monitor screen free from window glare and light reflections. Clean screen glass regularly.

9) Pay special attention to monitor height and placement in relation to head and neck posture, particularly if you wear reading, bifocal, trifocal or progressive glasses. The monitor should be located below eye level as low as comfortable for your eyes' natural "reading angle" (approximately 30 degrees below horizontal.)

D) Request a workstation evaluation by contacting PGE Safety & Resiliency, 503-464-7302.

504 General Ergonomic Guidelines

A) Material lifting, carrying and handling:

1) Prevent back injuries, repetitive motion injuries and risk of strains and sprains by:

a) Warming up before doing manual work.

b) Using mechanical devices to reduce loads whenever possible (forklift, pallet jacks, carts).

c) Using a cart rather than carry heavy materials, if possible. PUSH rather than pull heavy carts.

d) Clearing a path before moving heavy or large objects.

e) Adjusting material locations and body positions to prevent overhead work, bending, twisting and other awkward positions.

f) Avoiding ongoing repetitive work by breaking up tasks, rotating through various tasks and taking breaks.

g) Reducing manual force such as gripping, pushing and pulling by using proper tools.

h) Avoiding excessive force on the body (such as jumping or pounding.)

i) Requesting assistance from co-workers when needed.

j) Using proper lifting techniques:

i) Keep back straight, bend at knees, use diagonal stance and leg muscles to lift.

ii) Keep load as close to body as possible and in line of power.

iii) When carrying heavier items, keep them between knee and shoulder level.

iv) Avoid twisting while lifting (turn with the feet).

B) Tool selection guidelines

1) Select tools that allow you to maintain straight wrists. Avoid bending or rotating wrists, e.g., “bend the tool, not the wrist.” An “in-line” tool design may be preferred, depending on how and where a tool is to be used.

2) Avoid static muscle loading. Reduce both weight and size of tool. **DO NOT** raise or extend elbows when working with heavy tools. Provide counter-balanced support devices for larger, heavier tools.
3) Choose a light-weight tool with a weight-balance design.
4) Avoid stress on soft tissues. Stress concentrations result from incorrect use of or poorly designed tools that exert pressure on palms or fingers. Examples include short-handled pliers and tools with finger grooves that **DO NOT** fit a worker's hand.
5) Reduce grip force requirements. The greater the effort to maintain control of a hand tool, the greater potential for injury.
6) Select tools that use full-hand power grip rather than a precision finger grip whenever possible.
7) Avoid sharp edges and pinch points. Select tools that will not cut or pinch hands even when gloves are not worn.
8) Avoid repetitive trigger-finger actions. Select tools with large switches that can be operated with all four fingers.
9) Isolate hands from heat, cold and vibration. Heat and cold can cause loss of manual dexterity and increases grip strength requirements. Look for tools with anti-vibration features.
10) Wear gloves that fit. While protecting the hands and fingers, gloves affect both strength and

dexterity. Tight-fitting gloves can put pressure on hands, while loose-fitting gloves reduce grip strength and pose other safety hazards (e.g., snagging).

600 Fire Safety

601 Fire Prevention Plan

A) A Fire Prevention Plan has been developed for the site where you work and includes a list of all major fire hazards and the equipment and procedures necessary to control each major hazard. Below are some of the specific issues covered by the fire prevention plan:

1) Storage and handling of hazardous materials to minimize chemical hazards in a fire.
2) Control of accumulations of flammable and combustible waste materials.
3) Procedures for regular maintenance of safeguards on heat-producing equipment to prevent accidental ignition of combustible materials.
4) Names or job titles of employees responsible for maintaining equipment to prevent or control fires.

602 Fire Prevention

A) Good housekeeping is one of the most effective means to prevent fires.

1) Weeds and other vegetation shall be controlled at power plants, near oil tanks, switch gear, lay down storage areas and near company buildings and property.
2) Gasoline and flammable liquids will be stored only in approved and properly marked containers.
3) Flammables and combustibles may not be stored in air-handler or electrical/mechanical rooms.

4) Use of gasoline to remove oil or grease from shop floors is prohibited. Use only nonflammable floor cleaning compounds.

5) Spills of oil, gasoline, paint thinner and other flammable substances shall be cleaned up immediately. Resulting oily rags and other flammable waste shall be handled according to prescribed waste disposal procedures.

6) Trash and other debris shall not be allowed to overflow containers provided for such use.

7) Clothing, paper, rubbish and other combustible materials shall not be permitted to accumulate in lockers, behind doors, in closets, etc.

B) Smoking is allowed in designated areas only.

C) Flammable and combustible liquids in buildings shall be properly stored in appropriate grounded fireproof cabinets.

D) Company vehicles will carry gasoline in company-supplied, ODOT-approved gas cans, which will be stored in a secure manner on the vehicle. Vehicles and systems that transport flammable and combustible liquids shall be well maintained and adequately marked as to contents in accordance with ODOT regulations.

E) Gases – No work that requires use of open flames or spark-producing tools shall be performed in any enclosure in which potentially dangerous gas mixtures might occur until it has been determined that an explosion hazard does not exist.

F) Electrical equipment and wiring.

1) Flexible cords shall not be supported on nails or metal hooks, or be run through doorways, windows, holes in wall or similar openings without protection from damage. Qualified personnel shall replace or repair frayed cords or broken plugs.

2) Drop lights and extension cords shall be used carefully and light bulbs shall be protected by suitable guards.

3) Proper covers shall be maintained on all explosion-proof and dust ignition-proof circuits.

4) Extension cords are allowed in workplaces as a temporary use for 90 days or less.

G) Fire prevention in the office:

1) **DO NOT** overload circuits or use equipment not approved for commercial use or which violates electrical and fire codes. If in doubt, contact Facilities, which can address questions regarding fire or electrical safety or additional power needs.

2) Shut off approved appliances and other heat generating equipment when not in use.

3) Appliances are not allowed outside of designated break rooms.

4) Personal workstation fans must be USB-powered.

5) Portable heaters, approved on a case-by-case basis by Facilities or a manager, must be positioned and used per manufacturers' instructions.

6) Holiday decorations must be UL-approved and unplugged when not in use. Trees and/or garlands must be fire retardant.

7) When extension cords are used in general office settings, cords shall be prewired types with built-in breakers that provide surge and overload protection. Extension cords shall not be plugged into one another (daisy-chained).

8) Discard combustible waste material promptly in approved containers.

9) Dispose of all refuse in proper receptacles, following all federal, state and local regulations.

10) Maintain 3-foot clearance in front of and beside electrical panels.

603 Fire and Hazmat Response

A) Special precautions may be required when responding to a fire at a public or customer site or where there are hazardous material cleanup activities taking place.

1) If fire department personnel are on site and PGE support is requested:

a) Check in with the incident commander or hazmat team leader.

b) Stay upwind of fire/smoke.

c) Attempt to disconnect power at the next closest disconnect point.

2) At sites where regulated hazardous material cleanup work is being performed:

   a) Site-specific vendor-provided training may be required.

   b) Special PPE, including the use of respiratory protection, may be required.

   c) Contact PGE Safety & Resiliency for assistance.

604 Fire Classifications/Incipient Fire Response

A) Fires are classified differently depending upon fuel material:

1) Class A: Fires involving ordinary combustible materials such as wood, cloth, paper and many plastics. Fires of this type require heat-absorbing (cooling) effects of water or water solutions, or coating effects of multipurpose dry chemicals to extinguish.

2) Class B: Fires involving flammable or combustible liquids such as gasoline, turpentine, ammonia and thinners. Generally, regular dry chemical, multipurpose dry chemical, carbon dioxide ($C0_2$), halon or foam may be used to extinguish.

3) Class C: Fires involving live electrical equipment. Use of nonconductive extinguishing agents, such as dry chemical, multipurpose dry chemical, halon, or carbon dioxide ($C0_2$) extinguishers are required to extinguish these fires.

4) Class D: Fires involving combustible metals such as magnesium, titanium, zirconium, lithium and sodium. Specialized techniques, extinguishing agents and extinguishing equipment are needed to control and extinguish these fires. Normal extinguishing agents generally should not be used, since there is danger in most cases of increasing intensity of fire due to chemical reaction between some extinguishing agents and burning metal.

B) An incipient fire is fire in an initial or beginning stage that can be controlled or extinguished by a portable fire extinguisher, use of Class II standpipes, or small hose systems (up to 1"). **DO NOT** use a portable fire extinguisher or other type of fire extinguishing device unless authorized or trained to do so.

605 Fire Extinguishers

A) Know the location and proper use of fire extinguishing equipment in your work area. All fire extinguishers are checked monthly and tested annually (by a qualified person), with dates marked on extinguisher tags. Report discharged fire extinguishers at once to an appropriate supervisor. Never return partially or fully discharged extinguishers to service.

B) Inspect fire extinguishers in vehicles monthly and exchange annually or after use.

C) Use correct portable fire extinguisher for type of fire:

Table 605-1. Fire Extinguisher Classes

Type of Fire	Class Fire Extinguisher
Wood, cloth, paper, rubber	A
Flammable liquids, gases, oil, grease	B
Energized electrical equipment	C

606 Fire Exits

A) Exits and exit accesses shall be maintained clear and unobstructed at all times and be clearly marked with proper signage.

B) Exit doors must be capable of being opened from occupied side at all times.

C) Fire doors (without fusible links) are to be kept closed at all times.

607 Combustible Dust

A) Dust suspended in air in the right concentration, under certain conditions, can become explosive. Even materials that do not burn in larger pieces (such as aluminum or iron), given the proper conditions, can be explosive in dust form.

B) Five elements are necessary to initiate a dust explosion, often referred to as the "Dust Explosion Pentagon."

1) Combustible dust (fuel).

2) Ignition source (heat).

3) Oxygen in air (oxidizer).

4) Dispersion of dust particles in sufficient quantity and concentration.

5) Confinement of the dust cloud.

C) If one of the above five elements is missing, an explosion cannot occur.

D) To prevent combustible dust fires from occurring:

1) Contain combustible dust to areas that are properly designed for it.

2) Eliminate or control ignition sources.

3) Minimize the escape of dust into work areas from equipment or spaces such as ducts, dust collectors, vessels and processing equipment that contain combustible dust.

4) Any dust that settles on workplace surfaces should be removed through a routinely implemented housekeeping program.

5) Areas or equipment potentially subject to explosions, including the dust collection system, should also be designed to relieve pressure in a safe manner, or be provided with proper suppression, explosion prevention systems, or an oxygen-deficient atmosphere.

608 Fixed Fire Protection

A) Fixed fire protection systems refer to systems that are built into various PGE facilities, such as generating plant equipment, World Trade Center offices and regional line centers. Fixed systems include, but are not limited to automatic sprinkler systems, carbon

dioxide systems and systems using dry chemicals, halon, Inergin and FM200.

B) Whenever a fixed fire protection system is activated, leave the area immediately and **DO NOT** re-enter until the responding fire department has deemed it safe to enter.

700 Health Hazards

701 Drinking Water

A) Staying hydrated is essential for health and safety at all worksites.

B) Potable drinking water is available from several sources throughout the company, including the municipal water supply, water filtration systems and supplied bottled water.

C) Refill reusable containers on a daily basis.

D) Wash and sanitize refillable containers weekly using a solution of 1 tablespoon liquid bleach per gallon of water. Let solution sit for 10 minutes, triple rinse and fully drain.

E) If you have any concerns about filtration systems at PGE facilities, notify PGE Facilities.

702 Heat Stress Prevention

A) As with any hazards, the best way to deal with heat hazards is to prevent them:

1) Dress for conditions. Lightweight, light-colored, layered clothing is best. Wear a hat with a wide brim if you are out in the sun. Cover as much of your body as possible.

2) Eat a regular well-balanced diet; stay away from hot or heavy food. Also watch salt consumption. **DO NOT** take salt tablets without a doctor's recommendation.

3) Take regular breaks in shaded areas whenever possible.

4) Drink plenty of fluids. **DO NOT** wait until you are thirsty. The best fluid to drink is water. Avoid caffeine or alcohol.

5) Liberally apply sunscreen to exposed body parts before you go out in the sun and reapply it frequently while you are outside. **DO NOT** get sunscreen in your eyes. Sunscreen is available through the storerooms.

6) Build up your exposure to the sun gradually.

7) Be aware that you can get sunburned in cloudy weather or when sun is reflected off water, concrete, sand or snow.

8) Wear cooling ice vests in hot areas as necessary. Always have at least one layer of clothing between the vest and skin.

B) See *Section 301* for symptoms and first-aid treatment of heat stroke.

703 Hypothermia and Frostbite Prevention

A) Hypothermia is a lowering of the body core temperature which, if not reversed, can result in death.

B) Frostbite is the freezing of body tissue that can result in tissue death.

C) Both are preventable.

1) When working in cold (from below freezing to 60^0F, wet and/or windy conditions), take the following preventive actions:

a) Wear or bring along protective, nonrestrictive clothing and equipment, including hat, hand gear, warm boots and extra socks. Several thin layers are better than one thick layer.

b) Stay dry. Promptly change wet clothing.

c) Snack frequently (eating keeps the body's metabolism elevated) and drink plenty of water. Avoid caffeine and nicotine.

d) Frequently exercise large muscle groups.

e) Avoid direct contact with cold objects and substances (e.g., metal, gases or solvents).

f) Use a buddy system. Constantly assess behavior and condition of extremities for signs of hypothermia or frostbite.

D) See *Section 302* for symptoms and first-aid treatment of hypothermia.

704 Indoor Air Quality

A) Healthy indoor environments are established through building design and construction and are sustained by careful maintenance and operation. Adequate space, balanced air distribution and fresh, outside air supply are essential elements of healthy indoor air. Controlling air pollution and moisture is also important.

B) PGE is committed to maintaining healthy office environments. To meet this commitment, the company:

1) Selects building materials and furnishings that have low pollutant emissions and minimize the collection of pollutants.
2) Encourages housekeeping and disposal practices that maintain low levels of accumulated dust and debris.
3) Minimizes use of hazardous chemicals.
4) Controls indoor air quality during repair, renovation and remodeling activities.
5) Controls the use of pesticides, using “less toxic” products and safe application methods.
6) Enforces PGE’s Tobacco Use policy (See My Workplace > Policies > Corporate Policies > Tobacco Use on the company intranet.)
7) Takes moisture control measures to minimize water damage in buildings or building equipment.
8) Locates outside air intakes to prevent drawing in pollutants.
9) Assists with creating fragrance-free work areas.
10) Secures air handling mechanical systems and intakes.
11) Performs regular maintenance on building ventilation systems.

C) Resolution of indoor air quality concerns.

1) Indoor air quality concerns may include temperature and ventilation issues, stuffy air, odors, chemical releases and health symptoms related to air quality. Indoor air quality concerns should be brought to the attention of Facilities, plant management, or facility site coordinators. As an option, a “mySafety” Hazard Concern may also be submitted.

D) Creating fragrance-free work areas.

1) Some individuals may experience adverse reactions to sources of fragrance in their work area. Sources of odor may include perfumes or colognes used by co-workers, cleaning products, room deodorizers, flower arrangements, some food odors, etc. Work groups are expected to work cooperatively to try to meet the needs of affected employees. Upon request, PGE Safety & Resiliency, Facilities or plant management can be asked to help evaluate cleaning products and require use of “fragrance free” supplies.

E) Additional information on PGE’s Indoor Air Quality program is available on PGE’s Safety intranet page.

705 Legionella

A) Building and operational systems that hold water at temperatures of 80°–120°F with sediment or scale can breed Legionella bacteria, which may result in respiratory illness. Because it is naturally occurring, the mere presence of Legionella does not necessarily create a health risk. However, the following steps

should be taken to control growth and reduce exposure.

1) Water systems or ponded water areas likely to breed legionella shall be sampled to ensure controls are effective. Water systems known to produce significant growth of Legionella shall be treated with disinfecting agents.

2) Employees who work in areas where airborne water mists or wet airborne particulates exist may be required to wear air-purifying respirators with P-100 particulate filters.

706 Untreated Sewage – Safe Work Practices

A) PGE crews can periodically come into contact with untreated sewage on the ground of a substation or underground vault or when operating a piece of equipment. Until the affected area is cleaned, follow the work practices listed below ***at all times***.

1) Avoid direct contact with untreated sewage or surfaces contaminated with sewage.

2) If contact with contaminated surfaces is likely to occur, wear the following PPE. For areas subject to arc flash, the PPE must be arc-flash rated.

   a) A pair of utility gloves.

   b) Disposable shoe covers

NOTE: If regular work boots have come into contact with untreated sewage, rinse with soap and water and let dry.

c) FR disposable coveralls (available in poison oak kits).

d) Safety glasses or face shield (if the potential for a splash of material exists).

3) Wash your face and hands thoroughly with soap and water before eating, consuming a beverage or using tobacco products.

4) In the event of contact to skin cut, abrasion or eyes/nose/mouth, wash the affected area thoroughly with soap and water or flush eyes/nose/mouth with water. Contact one of PGE's nurses to discuss what further actions need to be taken, if any.

5) If necessary, a clean-up contractor may be called to provide clean-up services. Contact PGE Safety & Resiliency or Environment & Licensing Services to assist.

6) PPE is available from the Storeroom and may be disposed of in a standard PGE trash receptacle.

B) For more information, contact PGE Safety & Resiliency.

800 Hearing Conservation and Noise

801 Hearing Conservation Program

A) The purpose of PGE's Hearing Conservation Program is to prevent employee injuries from exposure to elevated levels of noise, in compliance with OAR 437 Division 2, Subdivision G (1910.95) Occupational Exposure to Noise. The program applies to all PGE personnel with a potential exposure to noise levels equal to or exceeding an eight-hour time-weighted average (TWA) of 85 decibels on the A-weighted scale (dBA).

B) See Our Company > Our Commitments > Safety > Hearing Conservation on the company intranet for details on this program.

C) The program is composed of the following elements:

1) An audiometric testing program.

2) Training requirements.

3) Procedures for PPE use and implementation of engineering and/or administrative control of noise.

4) Collection of sound level meter readings and dosimetry measurements.

802 Audiometric Testing

A) Employees exposed to noise levels equal to or exceeding an eight-hour TWA of 85 dBA must participate in PGE's Hearing Conservation Program (HCP).

B) HCP participants will receive an initial audiogram (baseline hearing test) within six months of beginning work and annual exams thereafter.

C) The purpose of annual follow-up exams is to determine any Significant Threshold Shift (STS) Oregon OSHA recordable hearing loss. The goal is to identify changes to employee's hearing that could otherwise go unnoticed. PGE uses a mobile testing service that allows instant notification of results to employees following hearing tests.

D) An annual schedule of audiometric testing sites, locations and times and a list of groups participating in the HCP (with exceptions by job title), can be found on the myPGE site referenced earlier.

E) Employees who are not part of the HCP but are interested in having an audiogram performed may do so upon request and be tested with their co-workers during scheduled site testing.

803 Training

A) Training will be provided to all HCP participants, covering the following subjects:

1) The effects of noise on hearing.

2) The purpose of hearing protectors.

3) The advantages, disadvantages and degree of protection offered by various types of hearing protection.

4) Instruction on selection, fitting, use and care of different hearing protectors.

5) The purpose of audiometric testing and an explanation of testing procedures.

B) Voluntary HCP participants may participate in scheduled training.

804 Hearing Protection and Engineering/Administrative Controls

A) All employees who may potentially be exposed to more than 85 dBA, and any employee whose work environment lends itself to nuisance noise, will be offered hearing protection and shall receive training on the use and care of hearing protectors. Hearing protectors are available for use by all employees.

B) Hearing protection is required when working around noise exceeding 85 dBA. Examples of common hazardous noise sources for your work area or operation can be found in sound level meter surveys and dosimetry results available from PGE Safety & Resiliency.

C) Generally speaking, if you have to shout to be heard by someone 3 feet away (at arm's length), the noise level is likely above 85 dBA and hearing protection should be used.

D) Make sure your hearing protectors seal properly. Insert earplugs to the correct depth in the ear canal. Contact your safety coordinator or PGE Safety & Resiliency if you need a different hearing protector other than what is available or if you have any questions about fit.

E) Areas having identified sound levels of 85 dBA or greater must be appropriately posted.

F) Any employee that has a concern about noise exposure may contact PGE Safety & Resiliency with questions or to request noise level monitoring.

G) When noise levels exceed a 90 dBA eight-hour TWA, the use of engineering or administrative controls will be considered to reduce employee exposure. These can include the use of enclosures or muffling systems, or rotating employees in and out of the area.

805 Noise Monitoring

A) General surveys: Where noise levels may exceed acceptable exposure limits, PGE Safety & Resiliency conducts general surveys of routine operations to identify sound levels of equipment, work areas and processes. Results of these tests are used to determine appropriate PPE and training requirements and whether the work site needs to be part of the HCP.

B) Prior to initial startup of new equipment/systems, the project or area manager shall ensure a noise level survey has been scheduled. Once completed, survey results will be distributed to area managers and all affected employees. PGE Safety & Resiliency is available to assist the project manager with these tasks.

C) Non-routine operations: Noise surveys will be conducted as soon as possible when non-routine operations commence and have the potential to impact overall noise levels. This is imperative so that any special PPE or exposure monitoring can be arranged.

806 Contractor Communication

A) When outside contractors or service personnel are working in a PGE-posted high noise level area, the contractor must follow hearing protection requirements for the area.

900 Housekeeping

A) Every employee is responsible for the orderliness and cleanliness of his or her immediate work area, as well as following these general housekeeping safety rules.

901 Office Environment

A) PGE facilities are inspected and surveyed for hazards as part of regular facility inspections on a monthly or quarterly basis.

B) PGE offices, buildings, yards and mobile equipment shall be maintained in clean, neat condition.

1) Floors and passageways:

a) Floor finishes must have anti-slip qualities. Notify Facilities of loose carpet, defective tiles or boards and warped or worn floor mats.

b) Passageways must be at least 32 inches wide and unobstructed.

c) **DO NOT** allow file drawers, electrical cords, wastebaskets or other objects to protrude into aisles.

d) **DO NOT** allow boxes to be stored in aisles and walkways or to be stacked more than 4 feet high; boxes must be stable.

e) Access and clearances to electrical breaker panels, fire extinguishers, fire hoses, fire sprinklers and fire doors must be maintained at all times per applicable code requirements. Be sure fire sprinkler heads are unobstructed by at least 18 inches.

f) The tops of cabinets along the spline, glass tiles and outer panels of work spaces along the hall should be kept clear of all items.

g) Keep showers, locker rooms and washrooms neat and sanitary.

h) Keep trash accumulation and collection of unused material to a minimum. **DO NOT** allow oily or soiled clothing, waste or food scraps to accumulate in lockers, washrooms, eating areas or company vehicles. Dispose of all refuse in proper receptacles, following all federal, state and local regulations.

i) Check stairways and exits regularly to ensure they are unobstructed and properly lighted.

j) Approach glass and solid doors with caution and open them slowly. Be mindful of where you are walking.

2) General office equipment:

a) If work stations, desks or chairs are not functioning properly or are posing safety or health hazards, contact Facilities, for adjustments and repairs.

b) Modifying office furniture and moving office furniture around without prior Facilities authorization is not allowed in PGE office or desk spaces.

c) Homemade shelves, monitor risers and similar items are not allowed in PGE offices or workspaces.

d) Personal chairs or other seating, including exercise balls, bean bags, etc., are not allowed in PGE offices or workspaces.

e) If you have an electrically adjustable desk, use care and caution when adjusting work levels. Report malfunctioning equipment.

f) If using an antifatigue mat, **DO NOT** roll chair over it but move mat out of the way when standing.

g) Personal or individual exercise equipment is not allowed in PGE offices or other workspaces.

h) Keep file drawers closed when not in use. Open only one drawer at a time. If desk or file drawers do not have functioning safety stops, report them to Facilities or your supervisor at once.

i) When not in use, keep paper cutters stored with the blade in the lowered position and the locking device engaged.

3) Electrical office equipment:

a) Fixed (permanent) machines must be hard-wired.

b) Computers, copiers, fax machines and other stationary electrical equipment should plug directly into a surge protector not a wall outlet. Daisy chaining surge protectors is not allowed.

c) Place cords where they will not pose a tripping hazard. Secure cords that must cross aisles

with rubber channels designed for this purpose.

d) Inspect cords regularly to spot defects. Follow cord management guidelines recommended by Facilities.

e) Position phones and presentation equipment in meeting rooms so that the cords will not pose a tripping hazard.

f) Use of electrical heating pads and unauthorized portable space heaters is not allowed. Personal electrical products, including but not limited to coffee warmers, toasters, toaster ovens and hot air poppers, are not allowed in office or kitchen areas.

g) Use of personal HEPA filters is not allowed in offices or other workspaces.

902 Shops/Storerooms

A) Shops:

1) All shop floors shall be kept free of grease and oil spots.

2) During use, drop lights, air hoses, tools, equipment and parts shall be placed to minimize chances of injury due to slipping or stumbling.

3) Return tools and equipment promptly to proper storage spaces after use.

4) Report all broken or unsafe tools, tag and remove from service and inform your supervisor.

B) Materials storage:

1) Promptly remove tools, equipment, scraps and refuse from floors, walkways, balconies, yards and work areas. Keep tools, equipment, boxes and other objects stacked in a safe and secure position when work is suspended.

2) Store tools in chests, racks or other safe places when work is completed. Store the heavier tools on the lowest racks.

3) Avoid storing boxes and other items in areas not intended for this purpose, such as on top of file cabinets or shelves, or in hallways/walkways.

4) Carefully protect, box or cover the edges of razor blades, thumb tacks or other sharp objects when storing in drawers.

5) Remove or hammer flat all projecting nails when taking materials or objects from packing cases.

C) Storerooms:

1) Mark permanent aisles and passageways.

2) **DO NOT** block marked passageways, exits, fire extinguishers and electrical panels.

3) When materials are stored at an elevation higher than ground level, such as a mezzanine floor, second elevation, roof or similar location, clearly mark storage area capacity. Provide handrails, midrails and toe boards.

4) At locations using mechanical handling equipment, allow for safe clearances wherever the equipment

must turn or pass, such as aisles, doorways and loading docks.

903 Company Vehicles

A) Keep truck beds and cabs in neat, safe condition. Properly load and secure materials on and in vehicles.

B) Dispose of all refuse in the proper receptacles back at headquarters, following all federal, state and local regulations.

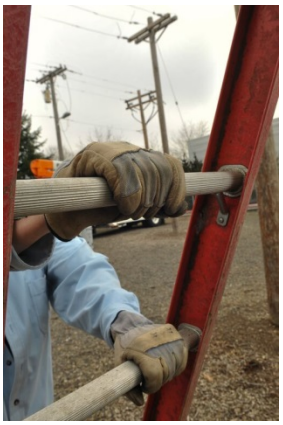
1000 Ladders and Scaffolds

1001 General Ladder Safety

A) Ladders shall be maintained in good condition at all times.

1) Inspect all ladders before use to ensure side rails, rungs, shoe assembly, etc., are in good condition.

2) Defective ladders shall be identified, tagged and removed from service immediately.



3) Ladders that are damaged or determined unsafe must be tagged: “Dangerous, **DO NOT** Use.” Ladders beyond repair shall be destroyed.

4) Ladders shall be inspected annually by a competent person.

B) **DO NOT** load ladders and scaffolds beyond their intended working loads.

1) No more than one person shall be on a ladder at the same time unless it is specifically designed for that purpose.

C) When ascending or descending, always face the ladder.

1) **DO NOT** carry tools and equipment in your hands.

2) Have free use of both hands when climbing up or down.

3) Maintain three points of contact at all times.

D) Use only nonconductive ladders when working on or near energized conductors or equipment.

E) **DO NOT** use any improvised substitutes for ladders such as boxes, barrels, chairs or tables.

F) Use ladders of the correct length.

1) Whenever possible, secure the ladder at the top to prevent slipping or falling.

a) If not possible, have a co-worker hold it.

b) When climbing onto a roof or elevated platform, the ladder side rails shall extend at least 3 feet above the landing.

2) **DO NOT** stand on the three top rungs of a straight, single or extension ladder.

3) **DO NOT** stand on or above the second step from the top of a stepladder.

4) Avoid overreaching.

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

H) A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to keep traffic away from the ladder.

1002 Stepladders

A) Stepladders are rated according to the loads they can withstand. See the table below for the five rating categories and typical uses.

Table 1002-1. Stepladder Ratings and Maximum Loads

Type	Duty Rating	Use	Load
1AA	Special Duty	Rugged	375 lb
1A	Extra Heavy Duty	Industrial	300 lb
I	Heavy Duty	Industrial	250 lb
II	Medium Duty	Commercial	225 lb
III	Light Duty	Household	200 lb

B) When using stepladders:

1) Be sure stepladders are fully open and locked before using.

2) Never use the top of a stepladder as a step or tool rest.

3) **DO NOT** climb on the back of the ladder unless designed for climbing.

4) Always use the correct ladder type and size for the job.

1003 Portable Straight Ladders/Extension Ladders

A) Use only PGE-approved portable ladders equipped with approved safety feet.

B) Always inspect ladders before use.

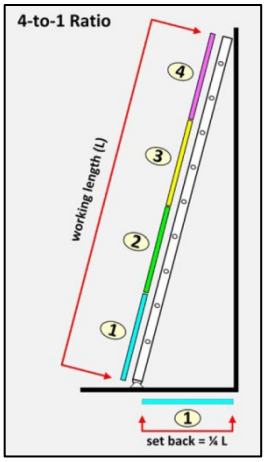
C) Always place the ladder feet on a substantial base and keep the area around the ladder clear while in use.

D) Whenever possible, secure the ladder at the top to prevent slipping or falling.

   1) If not possible, have a co-worker hold it.

   2) When climbing onto a roof or elevated platform, the ladder side rails shall extend at least 3 feet above the landing.

E) Place the ladder so the horizontal distance from the ladder feet to the top support is one-quarter of the working length (see figure at right).



F) All extension ladders must be equipped with necessary guide irons, locks and hooks. Always ensure the ladder is locked before use.

G) Always adjust extension ladders so the sliding (upper) section is on top of base (lower) section. Never disassemble and use ladder portions separately.

H) On two-section extension ladders, minimum overlap for the two sections in use must be as follows:

Table 1003-1. Extension Ladder Overlap Requirements

Ladder length (feet)	Overlap (feet)
Up to and including 36	3
Over 36, up to and including 48	4
Over 48, up to and including 60	5

1004 Scaffolds

A) Scaffolds shall be designed by a competent person and constructed and loaded in accordance with that design.

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

C) Scaffolding workloads shall not be exceeded.

D) Scaffolding shall be maintained in a safe condition and inspected daily prior to use.

E) Scaffolds shall not be altered or moved horizontally while in use or occupied.

F) Damaged or weakened scaffolding shall immediately be removed from service and tagged. Only a competent person can repair the scaffolding.

G) Use top rails, midrails and toe boards when scaffolds are 10 feet or higher, or from 4 to10 feet high, and if less than 45 inches wide.

H) Tools and objects on scaffolds shall be kept to a minimum.

   1) All tools, equipment and materials shall be properly secured or removed from the scaffold at end of shift.

   2) **DO NOT** allow accumulation of debris in quantities sufficient to create a hazard.

I) Remove loose tools, equipment and materials from platform prior to moving scaffolding.

J) Lock or remove wheels from wheeled scaffolds before use.

K) Overhead protection shall be provided for employees on scaffolds that are exposed to overhead hazards.

L) Materials being hoisted onto a scaffold shall have a tag line.

M) Employees shall not work on scaffolds during storms or high winds.

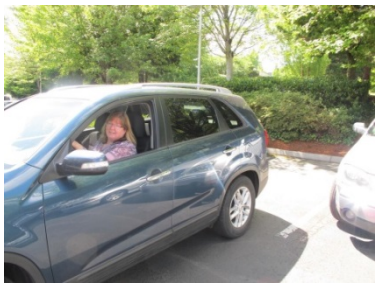
N) When faced with wintry conditions, all ice or snow must be removed and planking sanded to prevent slipping before work can proceed on scaffolding.

1100 Motor Vehicle Operations

1101 Employee Responsibilities

A) All employees who operate personal or company-owned vehicles during the performance of their jobs are required to do so in a safe and courteous manner, obeying all applicable laws, regulations and policies. Refer to PGE's Driving Policy, the PGE *Driving Safety Manual* and the Fleet Vehicle and Equipment Policy for more details about the following.

1) Vehicle operator requirements
2) Vehicle backing procedures
3) Vehicle assignment
4) Commuting in company-owned vehicles
5) Use of fleet vehicles
6) Fleet vehicle appearance
7) Fleet vehicle fueling
8) Motor vehicle records
9) Violations that can result in suspended licenses
10) Avoidable incidents
11) Driving improvement program



B) It is the employee's responsibility to maintain a valid driver's license or Commercial Driver's License (CDL) with a medical certificate (medical card), as required.

Refer to the PGE *Driving Safety Manual* for details on license requirements and renewals.

1102 Supervisor Responsibilities

A) New drivers – Supervisors must arrange to have a new driver evaluated before allowing that driver to operate a Commercial Motor Vehicle (CMV) for PGE. Contact Fleet Services' Driving Program administrator for evaluation assistance.

B) Tired drivers – Supervisors will take appropriate action (e.g., ensuring employee gets rest or making other arrangements) when an employee reports he/she is operating while fatigued.

C) Inexperienced drivers – Supervisors will take appropriate action when an employee does not have adequate training or experience to operate a vehicle.

D) Roadside inspections or traffic violations – Supervisors are responsible for ensuring that drivers who have undergone roadside inspections by motor carrier enforcement or had an encounter with law enforcement have complied in a timely manner with any violation instructions. For example, inspection violations require that repairs be made and the signed document returned to ODOT within 15 days. Traffic violations may require timely payment of a fee or appearance in court.

E) Daily vehicle inspections – Supervisors are responsible for ensuring that employees conduct required vehicle inspections before entering public roadways and complete associated required written report if repairs

are needed. This procedure will be monitored for compliance.

F) Vehicle incident review – Supervisors are responsible for ensuring vehicle incident reviews are conducted as required.

1103 Defensive Driving and Driving Improvement

A) Refer to the PGE *Driving Safety Manual* for information on the following:

1) Preventing a collision.
2) Aggressive driving/road rage.
3) Distractions.
4) Tired driver/“highway hypnosis.”
5) Communications and driving.

1104 Road Conditions

A) Employees should be aware of changing road conditions and adjust their driving accordingly. The PGE *Driving Safety Manual* provides guidance on the following road conditions and traction device requirements:

1) Wet conditions and hydroplaning.
2) Reduced visibility.
3) Snow and ice.
4) Minimum chain requirements.
5) Night driving.

1105 Vehicle Backing Procedures

A) All employees who drive, operate, ride in, or work around vehicles and equipment as part of their jobs must follow PGE's Vehicle Backing Procedures, which are referenced in the PGE Driving Policy.

1106 Parking

A) When arriving at a destination, follow all vehicle backing procedures.

B) The best deterrent to a parking incident is awareness and preparedness. When parking a vehicle:

1) Ensure the vehicle is in safe position.
2) Turn off the engine.
3) Place the vehicle in lowest gear or park position.
4) Set the parking brake.

C) When parking a vehicle on a hill:

1) Ensure front wheels are pointed into the curb.
2) If there is no curb, chock or block wheels to prevent the vehicle from rolling.

D) Always protect trucks or trailers disabled on public roadways by posting proper warning devices as per state or local requirements. Refer to the PGE *Driving Safety Manual* for specific information.

E) **DO NOT** park vehicles on bridges or other culverts except when necessary to perform work; take proper safeguards to avoid accidents.

NOTE: Parking spaces at PSC and PGE's Readiness Center are angle parking that requires backing in due to the traffic-flow pattern.

1107 Small Utility Vehicles

A) Small utility vehicles (SUVs) include, but are not limited to, the following:

1) Golf carts
2) All-terrain vehicles (ATVs)

B) The following safety rules should be followed when operating small utility vehicles:

1) Prior to each use, perform safety checks on the vehicle according to manufacturer's recommendations.
2) Obey speed limits at each facility. Vehicle speed shall not exceed 15 mph.
3) **DO NOT** exceed occupancy and load limits.
4) Vehicle occupants must be in designated seats using seat restraints.
5) While the vehicle is moving, vehicle occupants must remain seated with appendages inside the vehicle at all times.
6) **DO NOT** drive on public thoroughfares unless the utility vehicle is properly licensed.
7) Exercise caution on uneven surfaces and during icy, wet, muddy, snowy and low-visibility conditions.

1108 Trailers

A) All operators using a trailer must be properly trained and qualified to operate a vehicle with a trailer.

B) Operator responsibilities:

1) When operating small material, pole, transformer, wire-stringing, trencher and backhoe trailers:

a) On trailers with tongue height adjustment, set towing vehicle height so the trailer is level and weight is evenly distributed on all wheels.

b) Refer to the PGE *Driving Safety Manual* for step-by-step procedures.

C) General guidelines:

1) Remember that you are driving with a trailer at all times. Avoid situations where you might be stuck or have to back up a long way.

2) Refer to the PGE *Driving Safety Manual* for step-by-step procedures.

D) Pretrip check:

1) Before beginning your trip with a trailer:

a) Make sure the trailer is securely connected to the hitch.

b) Ensure brake lights and signals are working properly.

2) Connecting the trailer:

a) The tongue on the trailer shall be properly attached to the vehicle hitch.

b) The locking mechanism must be securely snapped down and lock pin in place.

c) Check for correct ball size.

d) Check the connection by pulling up on the trailer to try to pull it off the hitch. If it detaches, reattach more securely.

e) Check the clearance of the connection.

f) Make sure any wheel or stand for the trailer is in the up or drive position.

g) In addition to the hitch attachment, all trailers shall be connected to the vehicles with two chains crisscrossing in an X shape between vehicle and trailer.

3) Checking brake lights and signals:

a) Connect electrical wires from trailer to vehicle

i) If no one is available to tell you whether lights work when you apply brakes, use the reflection of another vehicle, window, or other reflective surface; or check in the dark.

ii) Never operate without working lights.

4) Check the operation of the brakes.

E) Driving with a trailer:

1) Before getting on the road, make sure you're familiar with driving your vehicle-trailer combination.

a) It is advisable to practice maneuvering in an open parking lot or other large, secure area, including some practice backups.

b) Backing up can be especially difficult. Try turning in the opposite direction you want to go; e.g., if you want the trailer to go right, turn the wheel left.

2) Making turns:

a) When pulling trailers, purposefully overshoot your turns, taking them wide enough so that the trailer's path does not put it off the road or in contact with curbs or other street-side obstacles.

b) Cutting a corner with a trailer will put the trailer, as well as pedestrians, other drivers, and yourself, in danger of collision.

c) If you start a corner too tight and get into trouble, stay calm and stop. Make sure the roadway behind is clear, back up a bit, and take the turn again wider.

d) Use a spotter when available.

3) Be aware of the size of the trailer you are hauling. What is its clearance? Could you drive it through a 12-foot-high tunnel?

4) Securely fasten any items on the trailer.

F) Stopping when hauling a trailer:

1) Remember the larger the load, the longer it will take to stop.

2) Keep extra distance between you and vehicles in front of you. Test the stopping power of your vehicle and trailer early in the trip before having to stop suddenly.

3) Use caution and drive conservatively.

4) Some large trailers have a braking mechanism that helps slow the trailer along with the vehicle.

G) Avoiding jackknifes:

1) Jackknifing occurs when the angle between a vehicle and trailer is less than 90 degrees, or beyond an L shape to a V shape. This most commonly occurs when backing up. Jackknifing can damage the hitch and trailer.

2) Avoid jackknifing by never allowing the trailer's position to go beyond an L shape.

a) When backing with a trailer, take it slowly and get a feel for the trailer's movement.

b) Keep movement of the steering wheel to a minimum. Should the trailer position begin to exceed 90 degrees, pull forward to straighten out and begin again.

H) For more information, go to the DMV website.

1109 Load Securement

A) Be sure that any load of equipment or materials is properly secured in compliance with ODOT regulations. Proper load securement is critical to protect employees, customers and members of the public from injury and minimize damage to equipment and vehicles.

B) Vehicles and equipment that exceed maximum size/weight limits are subject to fines and are the responsibility of the operator. For details on how to calculate size/weight limits, refer to the PGE *Driving Safety Manual*.

1110 Oversize Permits

A) PGE Fleet Services is responsible for oversize annual and one-time trip permits and will assure that every permit is current when distributed to the intended vehicle.

B) Drivers are also responsible for checking that permits are current and to notify Fleet Services if something needs to be updated or replaced.

C) The PGE *Driving Safety Manual* has detailed information on size exemptions, pilot vehicle requirements and how to obtain permits during business hours, after hours and weekends, if needed.

D) There are specific requirements at Oregon weigh stations and for random roadside inspections. Refer to the PGE *Driving Safety Manual* for procedures.

1111 Commercial Motor Vehicles (CMV)

A) All drivers of CMVs are required by federal and state law to inspect their vehicle before entering a public roadway. Federal and state inspectors may also inspect your vehicle. If they judge the vehicle to be unsafe, they will put it out of service until it is fixed.

   1) All operators are required to perform daily pre- and post-trip inspections.

   2) The PGE *Driving Safety Manual* provides detailed procedures on vehicle inspections and reporting.

1112 Operating Vehicles Near Energized Lines

A) Maintain minimum clearances from exposed energized lines and equipment.

B) Use a safety watcher as needed. If you can't determine the distance between the vehicle or vehicle equipment and energized parts, post a qualified person to provide warning when the equipment approaches minimum clearances.

C) If equipment may become energized or uninsulated parts may come closer than minimum clearance:

   1) Treat equipment and attached load as energized. Employees on the ground may not contact the equipment or load unless they use electrical protective equipment appropriate for voltages involved.

   2) Insulate equipment for voltage involved.

D) Vehicle tagging requirements: Any boom involved in an arcing fault at 120 volts (V) or above or coming in

contact with energized lines must be stowed as safely as possible, tagged and removed from service. It must then be inspected by a PGE mechanic before re-use. The mechanic may require additional inspection by the manufacturer.

1113 Safe Transport of Employees

A) Employees shall only be transported inside the cab of the vehicle where they have access to a seat and a seat belt.

B) Transporting employees on the outside of a vehicle or other motorized equipment is not allowed under any circumstances other than as noted in the exception below in 1113 C).

C) ***Exception:*** Employees may ride in an aerial manlift bucket ***only for incidental*** repositioning at a pole ***and*** if:

1) The truck is on solid even ground.

2) The bucket is returned to its stowed position.

3) The employee is wearing an approved harness and properly clipped in.

4) A person on the ground has direct visual and verbal contact with both the driver and employee in the bucket, giving directions to the driver as they reposition the vehicle.

NOTE: Aerial manlift devices such as JLGs and mobile scissor lifts which are designed to be operated from their basket/platform during travel at a jobsite are exempt from the above-stated requirement. This is due to the design of the equipment of this type.

1200 Pre-Job Briefings/Tailboards

A) Employees shall perform a hazard assessment to identify and address existing conditions that pose actual or potential safety hazards.

B) Two or more employees involved in work on power generation, transmission, distribution installations and related equipment for the purpose of communication or metering must perform a pre-job briefing and document the discussion as required by their work group.

C) An employee working alone need not conduct a job briefing. However, the employee shall ensure that the tasks to be performed are planned as if a briefing were required.

D) Number of job briefings:

1) Conduct at least one job briefing before starting actual work each day or shift.

2) Additional job briefings shall be held if significant changes that might affect the safety of the employees occur during the course of the work. When this occurs, all work must stop until the additional briefing is completed and documented.

E) The employee in charge shall conduct a pre-job briefing/tailboard with the employees involved with the job. The briefing shall cover:

1) Hazards associated with the job (e.g., electrified equipment, uneven terrain, high vegetation, ditches, traffic, etc.).

2) Energy source controls.

3) Work procedures to use.
4) PPE required.
5) Special precautions.
6) Review of Six Safety Rules to Live By.
7) Emergency notification methods/emergency preparedness.

F) The pre-job briefing/tailboard discussion shall be documented on job briefing forms and all individuals on-site must sign this form. If anyone is unsure about the work practices involved, the employee in charge must clarify all issues before employees sign the form. When a crew cannot agree on a common approach to the work, the supervisor shall be notified.

1) If anyone joins the work crew after the briefing, he/she must review the safety briefing form, ask any questions needed for clarification and sign that he/she understands.
2) The location of crews shall be prominently noted on the job briefing form to provide a reference point if emergency services must be called.

G) The completed and signed job briefing form will be kept readily visible and accessible so crew members know where it can be found.

NOTE: When work will also be performed by non-PGE employees, they should be included in the briefings to ensure that information about hazards associated with ***their portion*** of the job are communicated to them.

1300 Safety Incident Reporting

1301 Contact the System Control Center

Call 503-464-8343 after radio notification to report information related to the event. If one of the following incidents takes place:

A) An employee requires medical attention and EMS is activated, except for employees at WTC and Generation locations, respectively.

B) A member of the public is injured or there is damage to his or her vehicle.

C) Equipment makes contact with an energized conductor.

1302 Reporting a Work Injury or Illness

A) If EMS is required, follow procedures in *Section 102 — Medical Emergencies*.

B) Employees must report work-related injuries or illnesses to their supervisor immediately.

C) For a non-life-threatening workplace injury/illness, employee ***must*** contact 24/7 Work Injury Nurse Line (844-228-2037) for medical advice. If immediate off-site medical care is needed, arrange to be transported to a medical provider. **DO NOT** drive yourself.

D) An employee injury/illness report must be submitted for all injuries and illnesses, preferably by the end of the day or work shift but no later than 24 hours after the incident. Reports are submitted using the online mySafety system or by a paper form if computer use is

not feasible. If an injured employee is not able to submit a report, a co-worker or supervisor can submit the report.

E) In addition, if off-site medical treatment is needed, a Workers' Compensation claim should be completed using the Job Injury or Illness Form (State Form 801, PGE Form 74035).

F) Safety incident review and follow-up:

1) It is the supervisor's responsibility to initiate an incident review, including requesting PGE Safety & Resiliency support as necessary, when an employee incident report is submitted and entered into mySafety. The process for completing incident review and closing incident records involves identifying causes and contributing factors, as well as corrective/preventive actions.

G) Other safety reports:

1) Use mySafety to report near misses and safety concerns/ suggestions.

2) If preferred, employees can submit reports anonymously via the mySafety Anonymous Reporting link on myPGE. Be advised, anonymous reports may lack enough information to complete PGE Safety & Resiliency follow-up to address the situation. Provide as much information as you are comfortable providing.

3) Hazardous conditions in a workplace should be reported immediately to a direct supervisor,

through mySafety, via phone or radio, or in person.

4) Contractor reports: Contractors are asked to provide reports of injuries and near misses that occur while providing services to PGE. PGE representatives who receive copies of contractor injury and near miss reports should enter them into mySafety as a contractor event.

1303 Motor Vehicle Incidents

A) For vehicle incidents that involve a member of the public (MOP) (either a MOP vehicle or MOP property damage), call the System Control Center at 503-464-8343.

NOTE: Refer to *Section 102 — Medical Emergencies* for emergency procedures.

B) Employees must report all vehicle incidents to their supervisor immediately.

C) If a motor vehicle incident occurs while conducting company business, report the incident regardless of vehicle ownership. Any incident involving a motor vehicle owned or leased by the company must be reported regardless of when or where it happened.

D) If the incident involves another party, gather detailed information from the party involved (name, address, driver's license number, insurance information, etc.) and note time, location, weather and other contributing factors. Also:

1) Obtain names and addresses of witnesses.

2) Take photos with your cell phone, if available.

3) If police assistance is requested, protect evidence as much as possible until an investigation can begin.

4) Maintain a businesslike demeanor and **DO NOT** discuss liability (e.g., who is to blame for the incident). Potential liability issues will be determined at a later time.

E) Submit a report using the online mySafety system or by paper form if computer-use is not feasible. If the driver is not able to submit a report, a co-worker or supervisor can submit the report.

F) Drivers are responsible for completing State of Oregon Motor Vehicle Accident Incident Forms when required by state law and/or company policy. Completing the state form AND notifying police are required when:

1) Damage to the vehicle you were driving exceeds $1,500.

2) Damage to any vehicle exceeds $1,500 and any vehicle is towed from the scene as a result of damages from this incident.

3) Injury or death resulted from this incident.

4) Damages to any one person's property other than a vehicle involved in this incident exceeds $1,500.

G) Post-accident drug and alcohol testing of the driver may be required. Please reference the PGE Drug and Alcohol Testing Requirements matrix on company intranet at http://sharepoint/HR/Safety/myPGE/Our-

Company/Initiatives/Safety/Drug-Alcohol-Testing/Post-Accident-Testing/testing_requirements.pdf.

1304 Near-Miss Reporting

A) A near miss is defined as any event that did not, but could under slightly different circumstances, result in injury, illness, death, property damage, loss of materials, or environmental damage. Employees reporting near miss events where a safety violation has occurred are not subject to discipline for the activities being reported.

B) To report a near miss, you can choose among these options:

1) Submit a near-miss report using mySafety (preferred method) by the end of the shift if possible but no later than 24 hours. You can choose to do this anonymously.

2) Complete a Safety Incident Report form and indicate it is a near miss by checking the correct box at the top of the form. Submit the completed form to your supervisor or your safety representative. You can choose to do this anonymously.

3) Report the near miss via telephone to your supervisor or safety representative.

1400 Slips, Trips and Falls Prevention

A) Falls are one of the leading causes of unintentional injuries in the United States. The following are guidelines for avoiding falls both at work and at home.

1401 Field Environment

A) Slip, trip and fall prevention tips:

1) Exiting vehicles:

a) Be aware of your environment. Look for hazards such as moving vehicles, uneven terrain, dogs, pedestrians (including running children), bicyclists, etc., before stepping out of a vehicle.

b) During inclement weather, test the surface of the ground with your foot to gauge traction before stepping out of the vehicle.

c) **DO NOT** jump off of trucks, trailers, equipment, etc. Be methodical in your steps.

d) Hold on to handrails/grips on trucks when descending and ascending. Use three points of contact.

2) Walk slowly though high grass/brush and on uneven terrain. Use a walking stick/pole to test the land in front of you if you cannot see where your foot is stepping.

3) Avoid walking over holes covered with plywood or other temporary covers unless certain they provide adequate support.

4) Remove tripping hazards (equipment, wood, rocks, etc.) from work area pathways whenever possible.

5) Be cautious when around an open pit. Barricade/tape the pit opening.

6) Secure electrical cords out of foot traffic areas.

7) Keep frequently used items where they can be easily reached.

8) Wear appropriate footwear with good support and slip-resistant soles.

9) Ensure adequate lighting both indoors and outdoors.

10) Never stand on a bucket/box/garbage can.

11) Keep truck bin doors closed when not in use and when practical.

12) If a slip/trip hazard cannot be easily remedied, note it on a pre-job/tailboard form to ensure all team members are aware of it.

1402 Office Environment

A) Slip, trip and fall prevention tips:

1) Walking inside offices and buildings is recommended over running/rushing.

2) Multitasking while walking is not recommended. The following hazardous actions are highly discouraged while walking:

a) Reading

b) Talking on the cell phone

c) Texting on a mobile device

3) Wear shoes with good support and slip-resistant soles.

4) Clean up spills immediately. Be careful when walking on wet surfaces.

5) Secure electrical and phone cords out of traffic areas.

6) Remove small throw rugs or use non-skid mats to keep them from slipping.

7) Arrange furniture to provide open walking pathways.

8) Keep drawers and cabinet doors closed at all times.

9) Never stand on a chair, table, or any surface on wheels. Use PGE-approved step stools/stepladders to reach items located at higher levels.

10) Hold on to handrails when ascending and descending staircases/escalators. Avoid wearing apparel that might cause one to trip or lose one's balance.

11) Remove tripping hazards (paper, boxes, books, etc.) from stairs and walkways.

12) If you notice walkways and steps in need of repair, a burned-out light or inadequate lighting on PGE property, or other hazards you can't resolve, report them immediately to PGE Facilities, 503-416-3940.

1500 Violent Behavior

A) Each employee has a responsibility to maintain a safe working environment for themselves and PGE customers.

   1) Most employees will never face a situation that poses the risk of a crime occurring or of violence on the job. However, if there is a threat of crime or violence, the employee's safety is of primary importance.

   2) Violence can be prevented through sound risk-management strategies and good communication.

B) If someone behaves in a threatening way while you are conducting your job:

   1) Remain calm and nonconfrontational.

   2) Back away and remove yourself from the location.

   3) Contact your supervisor immediately.

   4) Contact Corporate Security for advice/assistance. If the offender is a stranger (not a customer), try to remember as much about the offender as possible.

   5) Call 911 if there is an immediate threat.

C) Minimize the chances of being a victim of crime by practicing the following:

   1) Be alert and aware of your surroundings.

   2) Leave the area if you see anything that makes you feel unsafe.

   3) Report any unsafe conditions to your supervisor.

4) **DO NOT** intervene or try to stop a crime from happening.

1600 Working Alone

1601 Remote Employees

A) Employees working beyond roadways and outside of radio contact need to take special precautions to ensure proper response can be made in event of an injury.

B) Carry communications equipment, clothing, food, water and supplies as needed.

C) Coordinate with a supervisor to ensure a proper plan is in place for remote work and potential EMS response.

D) Check in with a supervisor or dispatch/coordinator when traveling to remote locations. Request a supervisor or dispatch/coordinator check in with you as appropriate.

E) Areas of work where this approach should be followed include:

1) The Mount Hood area.

2) Remote locations within region (e.g., without radio or cell service).

3) Travel to generation locations.

4) Remote transmission work.

F) See also *Section 3000 — Electrical Safety – Working Alone on Exposed Energized Equipment.*

Field Activities

1700 Battery Safety

1701 Battery Room Requirements

A) Battery rooms will be constructed to meet federal, state and local standards and designed to meet ventilation requirements.

B) Identification and warning signs will be posted at all entrances to battery rooms or compartments. This will include “No Smoking” signs.

C) Unsealed batteries are to be located in battery rooms or enclosures with outside vents.

D) Racks and trays will be substantial and treated to make them electrolyte-resistant.

E) Floors should be of acid-resistant construction unless protected from acid accumulations.

F) Facilities for quick drenching of the eyes and body will be provided within 25 feet (7.62 meters) of battery handling areas. This will include emergency eyewash stations and showers.

G) Fire protection equipment, such as fire extinguishers, material and equipment for absorbing spilled electrolyte, and baking soda to neutralize electrolyte spills will be kept available outside the main door.

H) The use of open flames, noninsulated tools that may generate sparks, or other sources of ignition will be avoided in battery rooms, except where cells are not actively gassing and the room has been ventilated.

1702 Entering Battery Rooms

A) Check the external environment of a battery room for abnormal conditions before entering.

B) Upon entering, turn on the exhaust fan and make sure venting is not blocked (e.g., by vegetation, animal nests, etc.).

C) Note the location of the eye wash station (and shower) and verify they have been inspected and tested as scheduled.

D) Check that fire protection equipment is available outside the main door.

1703 Handling Batteries

A) Workers handling storage batteries should first discharge the static electricity from their bodies by crossing the anti-static rubber mat.

B) Battery hazards:

1) There are four main hazards associated with batteries.

a) Battery acid: The electrolyte in a battery is corrosive and can burn skin or eyes, eat holes in clothing, or even etch a concrete floor.

b) Flammable gases: Batteries emit hydrogen gas, which is flammable. It ignites easily and can cause a fire or explosion if allowed to accumulate in a small area.

c) Electrical shock: DC voltage and current flow can cause injuries that include burns and may even stop your heart.

d) Weight: Batteries, like those used in forklifts, are heavy and require proper material handling equipment to lift them safely.

C) PPE required when working with batteries:

1) Chemical safety goggles.

2) Full face shield.

3) Chemical-resistant gloves.

4) Chemical-resistant apron.

1704 Charging Batteries

A) Battery charging installations will be located in areas designated for that purpose.

B) Charging apparatus will be protected from damage by trucks.

C) When batteries are being charged, the vent caps will be kept in place to avoid electrolyte spray. Vent caps shall be maintained in functioning condition.

1705 Battery Storage and Disposal

A) Batteries must be segregated into mixed batteries, rare-earth batteries, wet cell (lead acid) batteries and damaged batteries:

1) Mixed batteries include nickel cadmium, nickel metal hydride, alkaline and 9-volt.

2) Rare-earth batteries include lithium, mercury oxide, silver oxide and button batteries. Terminals for these batteries should be stored with terminals covered in clear plastic tape.

3) Wet-cell batteries include vehicle lead-acid batteries, which are disposed of via PGE garages. Terminals for these batteries should be stored with terminals covered in clear plastic tape.

4) Damaged batteries include those removed from service due to leaks or other hazards.

    a) Damaged wet-cell batteries are managed as hazardous waste and disposed of through PGE's hazardous waste vendor.

        i) Place damaged wet-cell batteries in a clear plastic bag, one battery per bag.

        ii) Place bags in a separate 5-gallon bucket labeled "hazardous waste, damaged wet-cell batteries only" and with a start date indicating when first battery was placed in the bucket.

    b) Damaged batteries, other than wet-cell batteries, are managed as universal waste and disposed of through PGE's universal waste vendor.

        i) Place damaged batteries in a clear plastic bag, one battery per bag.

ii) Place bags in a separate 5-gallon bucket labeled “damaged batteries” and with the start date indicating when first battery was placed in the bucket.

1800 Confined and Enclosed Spaces (Six for Safety)

1801 General Guidelines

A) Confined/enclosed spaces are defined as follows:

1) A confined space is large enough and configured so that an employee can fully enter the space and perform work. It has limited or restricted means for entry or exit and is not designed for continuous occupancy. Confined spaces include, but are not limited to: tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, equipment housings, ductwork and pipelines.

NOTE: If a space is not considered to be a confined space as defined by Oregon OSHA, then confined space entry rules **DO NOT** apply.

2) An enclosed space is designed for periodic entry under normal operating conditions and does not (under normal operating conditions) contain a hazardous atmosphere. Enclosed spaces include manholes, vaults, tunnels, or shafts with limited means of egress or entry.

B) These types of work environments have the potential to contain the following hazards: hazardous atmosphere, engulfment and entrapment hazards and other types of recognized safety and health hazards such as unguarded machinery, exposed live wires, or the potential for heat stress.

NOTE: Prior to beginning work, review specific confined/enclosed space procedures established for your work group.

C) Roles and responsibilities:

1) Supervisors are responsible for the following:

a) Implementing these procedures.

b) Complying with Oregon OSHA rules pertaining to confined/enclosed spaces.

c) Determining if any work environments are confined/enclosed spaces.

d) Requiring employees entering confined/enclosed spaces to be properly trained.

2) Employees are responsible for abiding by the requirements of these procedures.

3) PGE Safety & Resiliency – Industrial Hygiene is responsible for conducting exposure monitoring as needed.

4) Technical Training is responsible for developing and providing training for entry into confined/enclosed spaces, including:

a) The hazards of confined/enclosed spaces.

b) Entry/exit procedures.

c) Rescue procedures.

d) Maintaining training records.

D) General Work Practices:

1) Removal of covers:

a) Before removing entrance covers to confined or enclosed spaces:

i) Conduct a hazard assessment.

ii) Check for excessive heat or pressure; loosen the cover gradually to release residual pressure.

iii) Evaluate conditions for a potentially hazardous atmosphere, such as oxygen-deficiencies or a flammable atmosphere.

iv) Eliminate any unsafe conditions prior to removal of the cover.

b) Protection of openings:

i) Install sturdy barriers immediately after removing confined or enclosed space covers. Position barriers to prevent accidental fall through the opening.

ii) Protect employees from objects falling into the space.

iii) Set up additional work area protections when confined/enclosed spaces are located within or near walkways or rights-of-way.

c) Rescue equipment and procedures/plans:

i) Equipment and procedures/plans are required to be in place or readily available for the prompt, safe rescue of employees in enclosed/confined spaces (see applicable confined/enclosed space procedures).

ii) The working condition and availability of all equipment must be confirmed before entry.

d) Ventilation:

i) If flammable gases or vapors are detected or if an oxygen deficiency is found in a confined/enclosed space, use forced air ventilation to maintain oxygen at safe levels and to prevent hazardous concentrations of flammable gases or vapors.

ii) If hazardous gases are not detected or found at safe levels and oxygen levels are sufficient, ventilation is not required if the atmosphere is continuously monitored.

iii) If continuous forced air ventilation is used, it must begin before entry and be maintained long enough to ensure a safe atmosphere before employees enter the work area. Ventilation will be provided in

the immediate area where employees are present and continue until all employees leave the confined or enclosed space.

iv) Air supply for continuous forced air ventilation will be from clean sources and may not increase hazards in the confined or enclosed space.

e) Ventilation procedures:

i) Position the air inlet in a fresh-air location free of vehicle exhaust or other pollutants.

ii) Position the air outlet within 3 feet of the bottom of the space and direct towards the immediate area where employees will be working.

iii) Ventilate the space until gas monitor readings indicate no hazardous atmosphere exists.

iv) Continue ventilating for the duration the space is occupied.

NOTE: For enclosed spaces with permanent power ventilation systems, ensure the system is operating.

v) Entry or re-entry of the vault is permitted only if conditions can be corrected. Otherwise, contact your supervisor.

1802 Confined Space Entry Procedures

A) General guidelines:

1) Confined spaces must be identified and posted with caution signs so employees know of their location and potential danger.

2) Any conditions making it unsafe to remove an entrance cover will be eliminated before the cover is removed.

3) When entrance covers are removed, procedures will be followed to guard the opening.

4) The work group supervisor will be designated as the entry super**v**isor, sharing duties and responsibilities. These are described later in this section.

B) Evaluation of confined spaces:

1) All new or previously identified confined spaces must be evaluated before entry, to determine if a permit is required or alternate entry procedures may be used.

2) This evaluation must include:

a) Air-quality testing:

i) The internal atmosphere will be tested for oxygen deficiency, flammable gases and vapors, carbon monoxide (CO), hydrogen sulfide (H2S) and/or sulfur dioxide (SO2), using a calibrated gas monitor or similar instrument that can collect and immediately analyze data samples.

b) A “fresh air check” Oxygen testing of the gas monitor must occur first to ensure accuracy of tests for flammability. Conduct the check as follows:

   i) Obtain a gas monitor from a docking station and ensure it is charged, calibrated and bump checked.

   ii) At the work site, turn on the gas monitor in a fresh-air environment. Perform a “fresh air check.”

   iii) Take readings at the top, middle and bottom of the confined space.

   iv) To use the gas monitor for continuous monitoring, place it at working height.

   v) Redock the gas monitor at the end of the work shift.

CAUTION: Gas monitors **DO NOT** identify all toxic atmospheres; be aware of other potential sources of hazards. Identify any known or anticipated hazards. Contact PGE Safety & Resiliency – Industrial Hygiene for support in conducting additional atmospheric testing.

NOTE: If the only hazard is a fall hazard, it is not covered by the confined space rules. If the space contains other hazards that make it a permit space, the fall hazard must be addressed on the permit.

c) Reviewing results of any previous evaluation of that space.

d) Reviewing any precautions and procedures previously implemented for entering the space.

C) Permit-required confined space entry procedures:

1) If the space is determined to be a permit-required confined space, appropriate entry or alternate entry procedures will be used to enter the space. These must include:

a) Review of the hazards of the space, as determined in the initial evaluation.

b) An evaluation of the hazards of the work to be performed.

c) Identification of safe entry conditions.

2) Before entry, a permit entry form must be completed with the following information:

a) Name/location of the space to be entered.

b) Purpose of the entry.

c) Date, start and stop times of the permit.

d) Names of entrants and current attendants.

e) Hazards of the space.

f) Acceptable entry conditions.

g) Results of initial tests and periodic monitoring performed to evaluate and identify the hazards and conditions of the space, or the period for continuous monitoring, accompanied by the

names or initials of the testers and by an indication of when the tests were performed.

h) Appropriate measures used before entry to isolate the space and eliminate or control hazards. Examples of appropriate measures include the de-energizing and lockout or tagging of equipment and procedures for purging, inerting, ventilating and flushing permit spaces.

i) The signature of the original supervisor authorizing entry.

j) The current entry supervisor.

k) Communication procedures for entrants and attendants to maintain contact during the entry.

l) Equipment provided for safe entry, such as:

    i) PPE.

    ii) Testing and monitoring equipment.

    iii) Communications equipment.

    iv) Alarm systems.

    v) Rescue equipment.

m) Rescue services available and how to initiate them.

n) Other information needed for safety in the particular permit space.

o) Additional permits issued for work in the space.

p) Any problems encountered during entry.

D) Alternate entry procedures:

1) Alternate entry procedures may be followed under the following circumstances:

a) ALL physical hazards AND hazardous atmospheres are eliminated (the conditions that caused the hazard no longer exist) or

b) ALL physical hazards in the space are eliminated AND

c) Hazardous atmospheres are controlled by use of continuous forced-air ventilation (continuous monitoring is required).

2) These procedures will describe:

a) Who can authorize alternate entry procedures and is responsible for ensuring safe entry conditions.

b) The hazards of the space.

c) The methods used to test the atmosphere within the space, where applicable, for all atmospheric hazards.

d) The methods used to eliminate hazards.

e) The methods used to determine if unsafe conditions arise before or during entry.

f) The criteria and conditions for evacuating the space during entry.

g) The methods for training employees in these procedures.

h) The methods for ensuring employees follow these procedures.

E) Duties of entry supervisors:

1) Know the hazards that entrants may face during entry, including the modes, signs, symptoms and consequences of the exposure.

2) Understand how to control or eliminate hazards associated with the space.

3) Verify that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before signing or endorsing the permit and allowing entry to begin.

4) Inform authorized entrants and attendants about the hazards and conditions associated with the space and the methods used to eliminate or control the hazards.

5) Terminate entry and cancel the permit when required.

6) When necessary, verify rescue service providers are available and that they can be summoned in an emergency.

7) Remove unauthorized persons who enter or who attempt to enter the confined space during entry operation.

8) Re-evaluate conditions in the space whenever responsibility for a confined-space entry operation is transferred, new hazards are identified or when work performed in the space changes.

9) Ensure entry operations remain consistent with terms of the entry permit, and that acceptable entry conditions are maintained while the permit is active, at intervals dictated by the hazards and operations performed within the confined space.

F) Duties of confined space attendants:

1) Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

2) Be aware of possible behavioral effects of hazard exposure in authorized entrants.

3) Continuously maintain an accurate count of authorized entrants and ensure that the means used to identify those authorized accurately identifies who is in the confined space.

4) Remain outside the permit-required confined space during entry operations until relieved by another attendant.

5) Communicate with authorized entrants as necessary to monitor entrant's status and to alert entrants of the need to evacuate the confined space if necessary.

6) Monitor activities inside and outside the confined space to determine if it is safe for entrants to remain in the confined space and order the authorized entrants to evacuate the confined space immediately under any of the following conditions:

a) If the attendant detects an unsafe condition.

b) If the attendant detects the behavioral effects of hazard exposure in an authorized entrant.

c) If the attendant detects a situation outside the confined space that could endanger the authorized entrant.

d) If the attendant cannot effectively and safely perform all the duties required by this section.

7) Summon help immediately if the attendant determines that the authorized entrants may need assistance. This includes alerting the control room or the System Control Center and the entry supervisor. Assist with subsequent rescue operations, if it becomes necessary.

8) Take the following actions when unauthorized persons approach or enter a confined space while entry is underway:

a) Advise the unauthorized person(s) that they must stay away from the confined space or exit immediately if they have entered it.

b) Inform the authorized entrants and the entry supervisor if unauthorized person(s) have entered the confined space.

9) Perform no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

NOTE: An attendant may monitor more than one space at a time if the duties for one space **DO NOT** interfere with duties for another space.

G) Duties of authorized entrants:

1) Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

2) Properly use equipment as required.

3) Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the confined space as required.

4) Alert the attendant if:

a) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.

b) The entrant detects a questionable condition.

5) Exit from the confined space as quickly as possible if:

a) An order to evacuate is given by the attendant or the entry supervisor.

b) The entrant believes it has become necessary to re-evaluate the space.

c) The entrant detects a questionable condition.

d) An evacuation alarm is activated.

H) Conditions for nonentry or evacuation:

1) **DO NOT** enter a confined space if:

a) Atmospheric testing indicates unsafe conditions.

b) Abnormal conditions have been identified.

c) There is a bad or unfamiliar odor, or evidence of hazardous substances.

2) If there is a bad odor or a gas-monitor alarm is triggered, do the following:

a) Exit the space if you have already entered.

b) Ensure the gas monitor is functioning properly by reading the gas monitor display for fault messages.

c) "Zero" calibrate the gas monitor by turning it off and then on in a fresh-air location.

d) Ventilate the space with fresh air for a minimum of five minutes. Retest until an acceptable gas monitor reading is obtained.

e) **DO NOT** enter unless odors have abated and gas monitor readings are acceptable.

3) If adverse health symptoms are experienced or a fresh-air environment cannot be established, contact your safety coordinator or supervisor.

I) For more specific information on confined space entry procedures, consult plant safety procedures or substation operations transformer entry procedures.

1803 Enclosed Space Entry Procedures

A) General guidelines:

1) Prior to entering an enclosed space, an evaluation of physical, mechanical and atmospheric hazards must be conducted by the person in charge, i.e., the supervisor or job foreman.

2) Any conditions making it unsafe to remove an entrance cover will be eliminated before the cover is removed. Visually assess the cover for damage and check that it is not hot. If conditions are abnormal, call your supervisor.

3) When entrance covers are removed, procedures will be followed to barricade the opening.

B) Air-quality testing:

1) The internal atmosphere will be tested for oxygen deficiency, flammable gases and vapors, carbon monoxide (CO), hydrogen sulfide H_2S and/or sulfur dioxide (SO_2) using a calibrated gas monitor or similar instrument that can collect and immediately analyze data samples. A “fresh air check” of the gas monitor must occur first to ensure accuracy of tests for flammability.

NOTE: If, after following steps in A (General guidelines), continuous forced-air ventilation is provided, air quality testing is not required provided procedures used ensure employees are not exposed to hazards posed by oxygen deficiency.

a) Testing procedures:

i) Obtain a gas monitor from a docking station and ensure it is charged, calibrated and bump checked.

ii) At the work site, turn the gas monitor on in a fresh-air environment. Perform a “fresh air check.”

iii) Take readings at the top, middle and bottom of the enclosed space.

iv) Then use the gas monitor for continuous monitoring; place it at working height.

v) Re-dock the gas monitor at the end of the work shift.

CAUTION: Gas detectors **DO NOT** identify all toxic atmospheres; be aware of other potential sources of hazards (e.g., cable off-gassing, sewer gas, after-fire events). Contact PGE Safety & Resiliency – Industrial Hygiene for support in conducting additional atmospheric testing.

C) Duties of enclosed space attendants:

1) Must be posted immediately outside the opening and offer emergency assistance if:

a) A hazard arises in the space.

b) Traffic patterns near the opening pose an exhaust fume hazard.

2) May perform duties outside the space if these **DO NOT** distract from monitoring employees within the space.

3) Must be qualified in first aid and CPR.

4) Must maintain two-way communications at all times (e.g., voice, visual, signal line, radio).

5) May enter enclosed spaces for short periods of time to assist qualified workers.

D) Conditions for nonentry or evacuation:

1) Check for abnormal conditions:

a) Use a heat gun to check for high resistance and overloaded connections and terminations.

b) Visually inspect cable(s) for abnormalities, e.g., bulging, swollen splices or oil leaks.

c) Determine if there is a bad or unfamiliar odor or evidence of a hazardous substance.

2) If there is a bad odor or a gas monitor alarm sounds, do the following:

a) Exit the space if you have already entered.

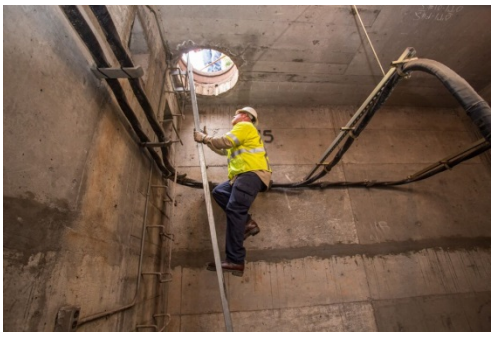
b) Consider the space a “confined space” and enter using alternate entry procedures outlined in subsection1802 D-H in this section.

E) Entry procedures for nonqualified workers:

1) Entry practices for nonqualified workers include but are not limited to:

a) Must be escorted by a qualified electrical employee who will evaluate electrical and other potential hazards to ensure safe entry of the worker.

b) Must follow PGE's enclosed space entry procedures as defined above or similar procedures that meet or exceed those.



1900 Cranes, Hoisting and Rigging

A) The section pertains to employees who have been trained in the mechanics of hoisting and rigging and have current qualifications for working around cranes. For more details, see PGE's *Rigging Manual* (available from your supervisor or Corporate Training).

1901 Cranes and Hoists

A) Cranes and hoists must be operated within the requirements of Oregon OSHA Div. 3 Subpart CC, which covers:

1) Assembly/disassembly
2) Power line safety
3) Inspections
4) Wire rope
5) Signaling
6) Fall protection
7) Work area control
8) Hoisting personnel

B) Crane safety around power lines

1) Before beginning equipment operations, the work zone needs to be identified and a hazard assessment conducted.
2) Identify the work zone by either:
   a) Marking boundaries (such as with flags or a range limit/range control warning device) and

prohibiting operations beyond those boundaries or

b) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.

3) Hazard assessment:

a) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line.

4) For more details, check Oregon OSHA requirements for crane operations.

1902 Rigging

A) Qualified riggers:

1) Only employees who are qualified riggers may perform hoisting activities for assembly and disassembly work. Additionally, qualified riggers are required whenever workers are within the fall zone and hooking, unhooking, or guiding a load, or doing the initial connection of a load to a component or structure.

2) In general, a qualified rigger is a person who:

a) Possesses a recognized degree, certificate, or professional standing, or

b) Has extensive knowledge, training and experience, and

c) Can successfully demonstrate the ability to solve problems related to rigging loads.

3) A designated qualified rigger must have the ability to properly rig the load for a particular job. However, each rigger may have different credentials or experience depending on job duties, so not every rigger may be qualified to do every type of rigging job. For example, experience and initial training does not automatically qualify a rigger to rig unstable, unusually heavy, or eccentric loads that may require a tandem lift, multiple-lifts, or use of custom rigging equipment.

4) For any particular job, there must be certainty that the designated rigger can do the rigging work needed for the exact types of loads, rigging and equipment that will be used.

1903 Crane Signaling

A) A signal person is required when:

1) The point of operation is not in full view of the operator.

2) The operator's view is obstructed in the direction the equipment is traveling.

3) Either the operator or the person handling the load determines that a signal person is needed because of site-specific safety concerns.

B) Both the crane operator and the signal person must be qualified signal persons. A signal person is considered qualified if he or she:

1) Knows and understands the types of signals used at the worksite.

2) Is competent in using these signals.

3) Understands the operations and limitations of the equipment, including the crane dynamics involved in swinging, raising, lowering and stopping loads and in boom deflection from hoisting loads.

4) Knows and understands relevant signal person qualification requirements.

5) Passes an oral or written test and a practical test.

C) Signal persons may be assessed and documented as qualified by either a PGE or third-party qualified evaluator.

NOTE: Hand signals for crane and line work are detailed in PGE's Cranes and Rigging training materials and have been included in the Appendices of this manual.

1904 Lifting Chains

A) Avoid shock loading chains. Remove any chain from service that has been shock loaded.

B) **DO NOT** lay or run chains over unpadded sharp corners or edges.

C) **DO NOT** kink or bolt chains to shorten or lengthen.

D) **DO NOT** use chains if:

1) Inspection shows a flaw, insecure weld, fracture or other defect.

2) Chain does not have an identification tag permanently affixed and legible identification markings prescribed by the manufacturer.

1905 Hand Lines and Drop Lines

A) Use only PGE-approved hand lines and drop lines.

B) Ensure weight does not exceed rated weight limit of block rating.

C) **DO NOT** hang lines on conductors, whether energized, de-energized or grounded.

D) Keep hand lines and drop lines clear of pedestrians and vehicles.

E) When performing aerial work, use as a minimum a 0.5-inch hand line kept in a secure position.

F) Store out of the elements.

G) Never use between the ground and an insulated aerial bucket.

1906 Winch Lines

A) Wear appropriate work gloves when handling winch cables.

B) **DO NOT** use your hand to guide or straighten winch cables on a drum while the drum is in motion.

C) When a winch cable is under load, stand where you won't be struck if the cable breaks.

D) Discard defective cables. **DO NOT** use winches with mechanical defects.

1907 Jacks, Hoists and Load Binders

A) Center a jack properly under the load.

B) **DO NOT** leave the jack standing under a load with its handle in the socket.

C) **DO NOT** rely on jacks alone to support a load you are working beneath. Use blocking.

D) When loading hoists and load binders, **DO NOT** exceed manufacturer load limit ratings.

1908 Ropes

A) Examine ropes carefully before use. Check for cuts, worn spots, acid stains and burns. Destroy rope if any of these defects are found.

B) When working in trees, use climbing ropes with these minimum characteristics:

1) Diameter of 0.5 inches.

2) Breaking strength of 2,300 pounds.

3) Elasticity of 7 percent (synthetic rope).

C) General rules:

1) Secure rope ends to prevent unraveling.

2) If you are on or in contact with the ground, treat rope as energized if it could come closer to exposed energized lines than specified clearance distances.

3) Avoid overloading.

4) **DO NOT** drag over rough or sharp objects or allow to rub against another rope. When securing, avoid short bends over unyielding or sharp-edged surfaces.

5) Avoid putting strain on a kinked rope.

6) **DO NOT** repair climbing rope by splicing.

7) **DO NOT** subject rope to high temperatures. Use proper types of rope whenever friction may cause high heat.

8) **DO NOT** use synthetic rope near storage batteries.

D) Rope storage:

1) Store away from cutting edges and sharp tools.

2) Avoid contact with corrosive chemicals, gas and oil.

3) Store suspended, in coils or piles. Make sure air can circulate through coils.

4) Hot ropes that are soiled, oily or greasy must be appropriately cleaned prior to being stored.

1909 Wire Rope/Slings

A) Inspect before use. **DO NOT** use if you find:

1) Loss or lengthening of its lay.

2) More than three broken strands on one lay.

3) Distortion of strands and broken wires.

4) Outside wires worn down to half the original diameter.

5) Signs of kinking or excessive strain.

6) The manufacturer's working load limit tag is missing or does not have an identification tag permanently affixed and legible identification markings prescribed by the manufacturer.

B) Care of wire rope:

1) Store on reels to avoid kinking and sharp bends.

2) Unreel wire rope; **DO NOT** remove it in loops from one end of the reel.

3) **DO NOT** allow turns of wire rope to overlap on a drum or winch.

4) When running over pulleys, avoid causing reverse bends.

5) Avoid short bends over unyielding or sharp-edged surfaces.

6) Ensure ends are whipped or brazed.

1910 Safety Snaps for Blocks

A) Be sure tackle block hooks are equipped with safety snaps.

B) Securely fasten overhead snatch blocks to prevent them from falling on persons below.

1911 Synthetic Slings

A) Inspect synthetic slings immediately before use.

B) Apply the same rules for care and use of synthetic slings as for synthetic rope.

C) **DO NOT** use synthetic slings unless marked with working load limits. If unmarked, dispose of them.

1912 Hoisting Cables/Conductive Material

A) Wire rope and other conductive materials shall not be used to raise transformers, poles or any other equipment or materials near energized lines, except:

1) When wire rope is rigged a sufficient distance below all energized wires to prevent the possibility of electrical contact.

2) When wire rope and any conductive material being raised are adequately protected.

3) When energized lines and equipment are adequately protected.

B) Maintain control of the wire rope at all times.

C) **DO NOT** use wire rope when it becomes worn, deteriorated, damaged, is missing its rating tag or does not have an identification tag permanently affixed and legible identification markings prescribed by the manufacturer.

D) **DO NOT** use metallic slings (chain or cable) near energized equipment. Whenever possible, avoid using chain slings for hoisting; if used, they shall be tagged with proper information. **DO NOT** use if it does not have an identification tag permanently affixed and legible identification markings prescribed by the manufacturer.

E) To remain non-conductive, synthetic hoisting/pulling lines and rope must be properly maintained to preserve their insulating qualities.

2000 Customer Work Site Safety

2001 General Guidelines

A) Pay special attention at all times when approaching or working on customers' premises. Beware of distractions.

B) If a customer is acting in a threatening manner, follow the guidelines described in *Section 1500 — Violent Behavior*.

C) Many industrial and commercial customers have strict rules governing persons entering and leaving their premises. These rules must be respected in every way. Identification cards shall always be used when entering establishments or any time customers question your identity as a PGE employee.

D) A safety tailboard should occur with customers to define general and specific hazards of their site and other safety requirements they may enforce.

E) Unusual hazards:

1) Electric meter employees must be aware at all times that they may encounter unexpected hazards on customers' premises. Safety devices may be altered or not in place and traps could be set. Adherence to all safe practices is essential to your safety and that of the customer.

F) Buildings under construction:

1) Electric meter work is sometimes required in buildings under construction or being remodeled. Take care under these conditions, as it is often

necessary to use temporary stairs, ladders or planks. Always inspect these carefully before use and **DO NOT** use them if there is any doubt of their condition.

2) Employees shall guard for falling material, unprotected shafts and floor openings, loose material and boards with protruding nails.

G) Wear all appropriate PPE when on industrial worksites, following PGE and Oregon OSHA standards plus any site-specific PPE required by the site owner.

2100 Dog Bite Prevention

A) Employees working on a customer's property should always be alert to dogs, even if they are not immediately visible. Take these steps to avoid injury.

1) Identify signs that a dog may be present:

a) Perimeter of inside fence line is trampled down.

b) Dog house or dog toys in yard.

c) Tethered chain/rope in yard.

d) Dog excrement in the yard.

e) Digging holes in the yard.

f) Doggie door.

2) Be aware of your environment and leave yourself an escape route.

3) When around unfamiliar dogs:

a) Be cautious. Always assume a dog that does not know you may see you as an intruder or a threat.

b) Never approach an unfamiliar dog, especially one that is tied or confined.

c) If an unfamiliar dog approaches you, **DO NOT** pet it without letting it see and sniff you first. Reach out slowly with your hand low in front of the dog and not above the dog's head.

4) Pay attention to a dog's body language and behavior.
    a) The friendly dog tail: Tail wagging, head up, relaxed body position.
        i) A more submissive dog may have its head down while wagging its tail. Approach this dog and all dogs with caution.
    b) The fearful-aggressive dog: Tail low, ears back, skittish, cowering.
        i) Constantly watch this type of dog. It may act very nervous and not let you get too close, but is waiting for an opportunity to bite. It will not come at you directly, but will wait for you to turn your back.
    c) The brave-aggressive dog: Tail straight, stiff posture, baring teeth, growling/barking.
        i) This dog will let its presence be known right away. It will growl, bark and often the hair on its back will stand up. It will not retreat as you approach. This dog will try to attack you.
    d) The unpredictable dog. This dog will give no obvious physical message of its intent. It will not act aggressively or friendly.
        i) Treat this dog as if it will attack at any moment, because it might.
5) **DO NOT** disturb a dog while it is sleeping, eating, chewing on a toy, or caring for puppies.

6) Be aware that a dog's behavior may change when a customer comes to talk with you or leaves the area. An angry customer, for example, can provoke a dog's aggressive behavior.

B) If you are approached by a dog that may attack you, follow these steps:

1) When putting space between yourself and a dog that might bite, never turn your back on the dog and run away. A dog's natural instinct will be to chase and catch you.

2) In a very firm voice, say a command that the dog may know:

a) "STAY"

b) "NO"

c) "STOP"

3) If the dog loses interest in you, slowly back away until he is out of sight.

4) If the dog does attack, "feed" him your jacket, a purse, a trash can lid or anything that you can put between yourself and the dog.

5) If you fall or are knocked to the ground, curl into a ball with your hands over your head and remain motionless. Try not to scream or roll around.

C) If you are bitten by a dog:

1) Try not to panic.

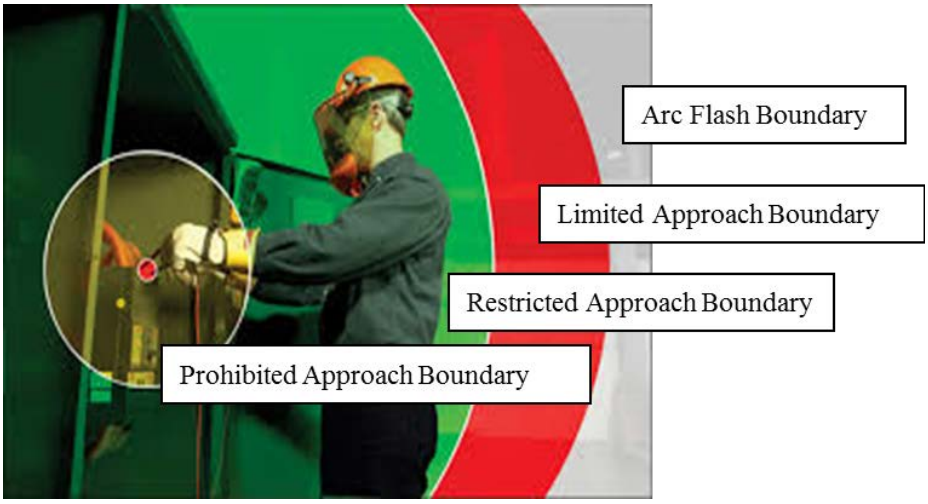
2) Seek a secure area away from the dog.

3) See *Section 402* for first-aid instructions.

2200 Electrical Safety – Arc Flash (Six for Safety)

2201 Arc Flash Safety Program

A) The best protection from an arc flash is to stay beyond the arc flash boundary to reduce the risk of injuries due to arc flash and associated heat, concussion and molten metal that may occur during an arc flash event.



1) The Arc Flash Boundary (outer boundary) is the farthest established boundary from the energy source. If an arc flash occurred, this boundary is where an employee would be exposed to a curable second-degree burn (1.2 calories/cm2). The issue here is the heat generated from an arc flash that results in burns.

2) The Limited Approach Boundary is an approach limit at a distance from an exposed live part where a shock hazard exists.

3) The Restricted Approach Boundary is an approach limit at a distance from an exposed live part in which there is a greater risk of shock.

4) The Prohibited Approach Boundary (inner boundary) is a distance from an exposed part that is considered the same as making contact with the live part.

B) All work involving conductors or equipment requires a pre-job briefing/tailboard that includes a hazard assessment to identify and address conditions that pose actual or potential safety problems. Once identified, hazards can be eliminated or otherwise addressed by using:

1) Engineered design changes.

2) Procedural/administrative controls (such as lockout-tagout [LOTO]).

3) Personal protective equipment (PPE).

4) Other appropriate means or a combination of methods to protect workers from safety hazards.

C) Required arc flash-rated clothing and PPE:

1) Employees exposed to potential hazards from electric arcs shall wear protective clothing and other PPE with an arc flash rating greater than or equal to the estimated heat energy.

2) The minimum rating for the outer layer of arc flash clothing is HRC 2. See Our Company > Our Commitments > Safety > Policies and Practices > FR Clothing Requirements and FR Clothing Matrix

on the company intranet for additional Arc Flash Safety Program information.

3) Protective clothing shall be in good working condition (e.g., without tears, missing closures or contamination).

4) Employees working on or near energized equipment or exposed to arc-flash hazards are prohibited from wearing clothing made from acetate, nylon, polyester, rayon and polypropylene, either alone or in blends for any layer, unless the fabric has been treated to withstand arc flash incidents.

5) Entry into substations with primary and/or transmission voltages requires wearing any combination of HRC 2-rated shirt, jacket, pants, and/or coveralls, in addition to HRC 2 arc flash PPE, hard hats and safety glasses.

6) Company-provided leather work gloves are acceptable for conditions with estimated incident energy of 14 cal/cm^2 or less.

7) Rubber gloves with leather protectors and heavy-duty work boots (e.g., leather boots with heels) are considered adequate protection of the area covered; additional arc flash protection is not required.

NOTE: All employees entering a substation are required to wear FR clothing, hard hats, safety glasses and boots. Safety glasses and hard hats may not be required, with approval of the person in charge of the work as documented in the pre-job briefing/tailboard form (as applicable), if the work being performed does not pose a risk to the employee's head or eyes. This exclusion is typically for indoor work and includes, but is not limited to, print work, wire identification and using electronic devices such as laptops and tablets.

D) Entry into electrical rooms and areas with electrical equipment always requires use of arc flash-rated PPE, except when electrical equipment is assured to be in normal operation. Normal operation of electrical equipment occurs when all of the following conditions are met:

   1) Equipment is properly installed.
   2) Equipment is properly maintained.
   3) All equipment doors are closed and secured.
   4) All equipment covers are in place and secured.
   5) There is no evidence of impending failure.
   6) Breakers, switches, disconnects and similar devices are not being operated.

E) At customer sites, specific arc flash-rated PPE may be required by the customer or required as determined by a hazard analysis.

F) When conditions change and the electrical equipment is no longer considered in “normal operation,” employees must leave the area unless they are wearing the proper PPE.

2300 Electrical Safety – Equipment (Six for Safety)

A) Only qualified, electrically trained employees shall perform work on electrical equipment.

B) A second qualified, electrically trained employee is required to be continuously present when working on energized conductors and equipment above 600 volts.

2301 Capacitors

A) Capacitors may have hazardous stored energy. Consult your department –specific work practices before working on capacitors. The following are general guidelines only.

1) Before beginning work, disconnect capacitor from the source. If primary fuses, verify there is no current with an amp stick before opening.

2) Wait five minutes for the capacitive charge to drain off.

3) For externally fused capacitor banks, short-circuit the bushings or, in the case of single-bushing capacitors, place a short circuit between bushing and case.

4) Short circuit out-of-service capacitors when transporting or storing.

a) For stored capacitors, a wire jumper must be installed between the two bushings or, in the case of single-bushing capacitors, the jumper is between bushing and case.

2302 Current Transformers

A) Unexpected high voltages may occur across a secondary open current transformer (CT) circuit. Voltages may reach primary values.

B) Work on CT circuits can only be performed by qualified employees.

C) CTs will look like load or a fault on the service when checked with a voltmeter or wiggie.

D) To check for a fault on a service that has CTs:

1) Connect a voltmeter across the CT secondary and the service to be energized.

2) Then connect a wiggie in parallel with the voltmeter leads.

   a) A noticeable dip in the line will be an indication of induction caused by current transformers; no fault should be present.

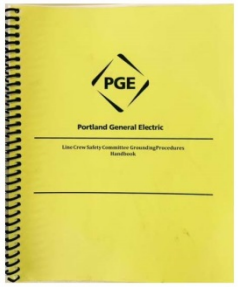
   b) No noticeable dip will generally indicate a fault.

   c) A very slight dip may be an indication of load on the service.

2303 Grounding

A) General guidelines:

1) For detailed instructions regarding grounding procedures, see the *PGE Line Crew Safety Committee Grounding Procedures Handbook* (available from PGE Safety & Resiliency).



Line Crew Safety Committee Grounding Procedures Handbook

2) Two qualified workers are required when installing portable protective grounds on primary circuits and equipment.

3) Treat conductors and electrical apparatus as energized unless properly grounded. (“If it’s not grounded, it’s not dead.”) Portable protective grounds are required before workers or equipment come within minimum working clearances of a circuit.

4) Install protective grounding cables so all phases of lines and apparatus are effectively bonded together in a multi-phase short and connected to the ground at one point.

5) Install personal protective grounds as close to work sites as is practical, so they are visible from the work site.

B) Verifying and testing:

1) Before installing grounds:

a) Use drawings as appropriate to verify the circuit configuration.

b) Visually verify that all de-energized equipment has been opened and cleared properly, danger tags are installed and personal protective grounds are installed on the proper equipment.

c) Verify that all sources of backfeed, such as station service and potential transformers, are disabled and included in tagging procedures.

d) For distribution direct-buried cables, refer to the appropriate one-line circuit diagram and verify proper clearance from all network sources. Include all PGE and customer-owned sources of backfeed, such as automatic transfer schemes, line potential transformers and station service transformers.

2) Test each phase with a “hot horn” or similar test device suitable for the rated voltage immediately before applying grounds. Verify tester operation with an energized circuit before and after testing the circuit to be grounded.

C) Connecting ground cables:

1) Grounding crew: An adequate crew for installing an initial set of grounds consists of two qualified workers. Complex installations may require additional support. Grounds may be removed by one qualified worker.

2) **DO NOT** use disconnect switches equipped with ground switch devices as a protective grounding device. Three-phase personal protective grounds are required on all de-energized and isolated buses.

3) Stay clear of grounding cables when applying grounds to conductors. Use a shotgun or similar hot-line tool to install personal grounds, regardless of the voltage. **DO NOT** hold the grounding cable with your hands. Have a co-worker support the belly of the wire with a hot stick.

D) Backfeed and induced voltage:

1) Before contacting the high-voltage (rated in excess of 600 volts) side of de-energized transformer or conductors, all possible sources of backfeed must be eliminated by disconnecting, grounding, or short circuiting the low-voltage side.

2) Always inspect a distribution circuit for backfeed, even if disconnected at a substation or in any other place, before installing grounds and proceeding with work.

3) Exercise caution to avoid induced voltage when working on or near de-energized lines and equipment in the vicinity of energized high voltage stations, and where energized lines run parallel to or cross over de-energized lines.

4) Take precautions to prevent backfeed from customer's equipment when disconnecting service conductors. Consider service conductors energized unless they are tested and grounded.

E) Grounding of substation equipment and tools:

1) To reduce the risk of lethal “step and touch” injuries when working in energized substations, all equipment and vehicles that workers could contact will be connected to the substation grounding system.

NOTE: During specialized testing operations, certain vehicles may be left ungrounded during the test period. In these cases the vehicle(s) must be barricaded and isolated. In addition, personal vehicles and PGE pool vehicles can be parked in the substation with supervisor approval when parked at a safe distance from energized equipment.

F) Grounding of operating mechanisms:

1) Inspection and repairs of operating mechanisms may be done without personal protective grounds if the worker in charge has proper electrical clearance (per the System Control Center/Load Dispatcher) and required minimum electrical working clearances will not be violated. If any worker believes an electrical hazard exists, apply grounds per the proper procedure after electrical clearance has been issued.

G) Maintaining personal protective grounds:

1) Inspect protective grounds before each use. Any grounding device with strands of broken wire, defective clamps or other deficiencies shall be tagged as defective and repaired or replaced.

2) Once annually, all personal protective grounds will undergo micro-ohm tests, based on current test procedures, and be inspected for damage. Electrical connections should be cleaned and tightened. Each device should be marked with appropriate label/sticker indicating month and year tested.

H) Substation grounding:

1) Grounding requirements within PGE substations are based on available fault current. Some substations require parallel grounds. Specific grounding requirements for each substation are identified in a list maintained by Substation Operations.

2) Personal protective grounds shall be connected to the lowest impedance path to the substation ground grid, which is typically through the grounding conductors connected to equipment or structures (http://sharepoint/protection/default.aspx).

2304 Transformer Testing

A) Prior to starting any test, a pre-job briefing/tailboard will be held by the testing technician and all members of a testing crew.

B) The meter/relay technician assigned to perform the transformer test is in charge of the area in and around the transformer being tested

1) Before work begins, the meter/relay technician will install barrier tape around the perimeter of the transformer.

2) Only personnel approved by the meter/relay technician may enter the barricaded area while the barrier is in place.

C) No employee is allowed on top of the transformer when Doble, bridge or impedance testing is underway. The employee may be on a ladder, man-lift or load tap changer (LTC), in which case the MAD must be observed.

D) Only a journeyman wireman or hot apprentice under the direct supervision of the journeyman wireman may run the deadman switch.

E) An apprentice wireman can install and remove test leads associated with transformer testing under the direction of the tester and journeyman present.

2305 Power Circuit Breakers

A) Obtain required clearances to ensure breakers are de-energized before beginning maintenance.

B) Use appropriate barricading to identify de-energized equipment and work area. Unauthorized individuals shall remain clear of the barricaded work area.

C) Maintain safe working distances from adjacent energized equipment during maintenance activities.

D) Working on power circuit breakers:

1) Before working inside the tank of any power circuit breaker, be sure the operating mechanism is rendered inoperable electrically and mechanically.

2) Any work requiring entry of an oil circuit breaker tank must be performed per the Substation Operations' Confined Space Entry Procedure.

2306 Coupling Capacitor Voltage Transformers and Potential Transformers

A) All CCVTs and PTs are considered energized until grounded with all primary and secondary voltage sources disconnected.

2307 Oil-Filling Equipment

A) When filling or circulating oil through an electrical apparatus, the oil handling equipment and the metal housing of the apparatus being filled must be grounded.

B) All bushings on the apparatus must be shorted and grounded.

C) All oil and air hoses, electrical cables and connection points will be strategically placed and marked to minimize tripping hazards.

2308 Voltage Regulators

A) Operation of voltage regulators can be hazardous. Only trained and authorized employees can operate voltage regulators. See department-specific work practices for detailed safety steps.

2309 Customer-Owned Electrical Equipment

A) PGE employees are not authorized to work on customer-owned electrical equipment other than described in this section.

B) Follow PGE's requirements when terminating PGE conductors or installing PGE meters on customer-owned electrical equipment.

C) PGE may enter into contractual agreements to provide services that allow PGE employees to work on customer-owned electrical equipment.

D) PGE personnel will complete any customer-required training, as needed.

E) Control of the electrical system being worked on by PGE shall be under the control of PGE personnel. PGE crews are empowered to stop work in the event of a safety concern or unusual event. They will notify the customer and PGE project management immediately if this occurs.

2400 Electrical Safety – Live-Line Work (Six for Safety)

A) Use live-line tools when working on lines or apparatus energized at voltages of greater than 600 V.

2401 Use and Care of Live-Line Insulated Tools

A) Use only approved live-line tools to handle energized lines above 600 V and only if you have been authorized and instructed in proper use, inspection procedures and care of tools.

B) Live-line tool storage:

1) Live-line tools that have not been issued should be stored in a warm, dry location.

2) Live-line tools issued to Generation sites should be stored in a warm, dry location.

3) Live-line tools issued and carried on vehicles shall be stored in appropriate containers/bins to prevent mechanical and weather damage.

C) When using live-line tools, wear rubber gloves if minimum approach distances (MAD) shown in *Table 2602-2* cannot be maintained.

D) Live-line tools showing any “leakage” or “tracking” shall be tagged and removed from service.

E) **DO NOT** bring metal parts of live-line tools or energized conductors into contact with cross arms, poles, associated hardware or equipment.

F) Use only approved blocks, ropes, slings and other tackle for live-line work.

G) Keep live-line tools clean of dirt and moisture. Never lay live-line tools directly on the ground.

H) Live-line tools shall be inspected and tested every two years. Refinished or repaired live-line tools shall be tested after repair.

2402 Installation of Insulating Barriers and Rubber Goods

A) For equipment and conductors energized at 600 V or less, insulating barriers and rubber goods may be applied with rubber gloves.

B) For equipment and conductors energized at voltages above 600 V, insulating barriers and rubber goods shall be installed with live-line tools.

2500 Electrical Safety – Metering Ops and Field Ops/Meter Reading

2501 Field Operations

A) Field operations and service inspectors:

1) Follow all PGE and Oregon OSHA practices for safe work practices.
2) Assess the customer's property as you arrive on the premises. Special attention and alertness is required at all times when approaching or working on a customer's property
3) Park on the street or back into the property if it can be done safely. Always do a walk-around of the vehicle before you leave the property.
4) Be aware of children and other people in the area.
5) Beware of all dogs, cats and other animals. Report animal bites according to company procedures.
6) Follow all Field Operations work practices.
7) Wear proper PPE: safety glasses, hard hats, FR long-sleeved shirts, approved footwear, gauntlet leather gloves, etc.

8) When practical, announce your presence and state your business when entering a customer's premise. Courtesy is the first element of safety. Also notify customers when you leave, if appropriate.

   a) When possible, before interrupting service, inform customers of the proposed work and the interruption they can expect.

   b) Hostile customers: If encountered, remove yourself from the premises, notify your supervisor and/or Corporate Security and follow proper procedures and policies. (See *Section 1500 — Violent Behavior*.)

2502 Meter Reading

A) Be courteous and professional when talking with a customer and respect the customer's property. When appropriate, announce yourself to the customer.

B) On customers' property, exercise caution when encountering potential hazards. Report dangerous conditions to your supervisor and note the account.

C) Wear appropriate clothing, including approved company-supplied clothing. There must be a visible PGE logo on the front and back of clothing. Wear appropriate shoes/boots with good traction.

D) Follow all meter reading work practices.

E) If unable to get to a meter because of locked gates or unfriendly dogs, follow established procedures. **DO NOT** risk injury to read a meter.

2503 Complex Meter Installations

A) Follow and observe all Meter Services work practices.

B) Check all city, state and county labels pertaining to installation work before beginning work.

C) Assess the scope of work and job hazards (real and potential).

D) Wear all appropriate PPE for the task. Reference Meter Services Field Operations (MSFO) PPE requirements and PGE's FR matrix.

E) Adjustment to customer equipment is situational, but as general rule, major repair of customer equipment is not allowed. When in doubt, always ask for a second opinion from a supervisor and/or another journeyman meterman.

F) When working on energized 480 V, self-contained equipment, all journeyman metermen or meterman apprentices require a safety observer. A safety observer will be a journeyman meterman, never an apprentice.

G) The safety observer must wear appropriate PPE for 480 V service. A pre-job briefing/tailboard between a meterman and safety observer will be conducted and documented prior to work being performed.

H) The safety observer will be positioned out of harm's way approximately 10 feet or farther from a meter base and near exit point. He/she will observe work and call out any safety issues.

I) Immediately cease work and assess the situation if unusual or unsafe conditions arise during a job.

2600 Electrical Safety – Minimum Working Clearances (Six for Safety)

2601 Standard Working Clearances (General Public)

A) Contractors and members of the general public who operate portable cranes, hoists and derricks must ensure that they and all parts of their equipment are positioned, protected, and/or operated so no part comes closer to energized power lines than indicated in this table.

Table 2601-1. Standard Working Clearances

Nominal voltage phase-to-phase	Clearance Required
50,000 V and below	10 ft. 0 in
50.1 to 70.0 kV	11 ft. 0 in.
70.1 to 120.0 kV	13 ft. 0 in.
120.1 to 240.0 kV	17 ft. 0 in.
240.1 to 350.0 kV	20 ft. 0 in.
350.1 to 550.0 kV	27 ft. 0 in.
550.1 to 800.0 kV	35 ft. 0 in.
800.1 to 1000.0 kV	42 ft. 0 in.

NOTE: These clearances **DO NOT** apply to qualified employees and equipment when performing authorized work on overhead and underground conductors, structures, or apparatus.

2602 Working Clearances (Qualified Employees)

A) For qualified employees, these alternate minimum approach distances (MAD) apply.

Table 2602-2. Alternative Working Clearances

Phase-to-Phase	Phase-to-Ground Exposure	Phase-to-Phase Exposure
Nominal Voltage (kV)	Distance	
0.50 to 0.300	Avoid contact	Avoid contact
0.301 to 0.750	1 ft. 1 in.	1 ft. 1 in.
0.751 to 5.0	2 ft. 1 in.	2 ft. 1 in.
5.1 to 15.0	2 ft. 2 in.	2 ft. 3 in.
15.1 to 36.0	2 ft. 6 in.	3 ft. 0 in.
36.1 to 46.0	2 ft. 8 in.	3 ft. 3 in.
46.1 to 72.5	3 ft. 3 in.	4 ft. 0 in.
72.6 to 121 kV	3 ft. 9 in.	4 ft. 8 in.
121.1 to 145.0 kV	4 ft. 4 in.	5 ft. 5 in.
145.1 to 169.0 kV	4 ft. 10 in.	6 ft. 5 in.
169.1 to 242.0 kV	6 ft. 8 in.	10 ft. 2 in.
242.1 to 362.0 kV	11 ft. 3 in.	18 ft. 2 in.
362.1 to 420.0 kV	14 ft. 0 in.	22 ft. 5 in.
420.1 to 550.0 kV	16 ft. 8 in.	27 ft. 1 in.
550.1 to 800.0 kV	22 ft. 7 in.	37 ft. 5 in.

B) When an employee performs work near exposed and energized parts and is protected by insulating equipment covering those parts or performing work using live-line tools — but is NOT wearing rubber insulating gloves — the employee must work from a position where he or she cannot reach into the MAD shown above. In addition, no uncovered portion of an employee's body may breach the MAD of any uncovered conductor not being worked on.

2700 Electrical Safety – Poles, Towers and Structures

2701 General Safety Requirements

A) All affected employees shall follow fall protection requirements detailed in this document and additional requirements specific to their work group.

B) Fall protection equipment (FPE) is the preferred choice to mitigate fall hazards.

1) If FPE cannot be used for some reason, an approved alternative work method shall be identified, communicated to all affected workers, implemented and documented as part of the pre-job briefing/tailboard process.

NOTE: FPE shall be engaged ground-to-ground while ascending, descending, changing position and in working positions.

C) To ensure devices are fit for use, all FPE components shall be inspected by climbers (per manufacturers' specifications) prior to each use.

D) When work is being performed on towers, lattice structures and poles, **DO NOT** stand underneath (e.g., "in the hole") while work is in progress unless directly helping employees working above. In that case, make your presence known. In addition:

1) Use tag lines or similar devices to maintain control of tower sections as they are raised or positioned, unless doing so creates a greater hazard.

2) Detach the load line from the member or section only after the load is safely secured.

2702 Working on Poles and Towers

A) Safe material handling work practices on overhead structures:

1) Raising and lowering of material, tools and other work-related components shall be accomplished by the use of an approved hand line.

2) Larger objects or objects exceeding hand-line capacity shall be raised or lowered by alternative methods such as rope and capstan or boom truck.

3) A clear zone, at a minimum of 10-foot radius or larger as field conditions dictate, will be established at the base of structures being worked on. Ground personnel will stay out of this area unless clear acknowledgement is established between ground help and employees working aloft.

4) When field conditions prevent the use of a hand line or alternative methods from being done safely, the pre-job briefing/tailboard form must reflect this and clear communication must occur to prevent employees from entering the drop zone while tools/materials are being dropped in a controlled manner.

2703 Pole-Top/Steel Structure Rescue

A) All journeymen and apprentices doing aerial work must be trained and competent in pole-top/steel structure rescue.

B) Non-journeymen working in line construction must be trained in pole-top rescue techniques appropriate to their jobs.

2704 Pole-Hauling and Handling

A) Transporting vehicle's wheels shall be blocked/chocked or securely braked before loading or unloading.

B) Before transporting, poles shall be securely fastened in at least two places on a truck or trailer.

C) After loading poles on a vehicle or trailer, properly secure all poles using approved load binders.

D) The trailing end of a load of poles shall be marked by a red flag during the day and a red light at night. Warning flags or amber lights should be placed in the center of long loads. An employee and/or vehicle shall be used for flagging when necessary.

E) Know the length and weight limits of your truck and trailer. Have the proper load and length permit in place.

F) When transporting poles on city/county/state roadways, observe all applicable city/county/ODOT regulations.

G) Employees shall not remain on a pole pile while poles are being moved, or ride pole dollies or trailers.

H) Load binders shall be so installed that they can be operated by employees from a safe position to prevent a rolling or crushing injury.

I) If poles are to be left overnight on or near streets, highways or walkways and could create a hazard, they shall be safeguarded by red lights or well-lighted warning signs or cones.

J) Poles shall be placed or blocked so they cannot roll.

2705 Setting/Removing Poles

A) When setting or removing a pole, **DO NOT** allow it to contact exposed energized conductors.

B) Install pole or line guards when setting, moving or removing poles where there is potential to contact energized conductors.

C) Wear appropriate Class 2 rubber gloves when setting, moving or removing a pole near an exposed energized overhead conductor. **DO NOT** contact the pole with non-insulated parts of your body.

D) Attend or physically guard pole holes. If that is not possible, install pole hole covers.

2706 Installation and Removal of Conductors

A) To avoid contact with energized lines or equipment, use the tension-stringing method, barriers or similar measures.

B) Maintain wire-pulling equipment, including pulling and tensioning devices, in safe working condition. Always inspect before use.

C) During conductor pulling and tensioning operations, establish an equipotential grounding zone to protect the operator. Always maintain reliable communications between the reel tender and pulling rig operator.

D) Refer to the *PGE Line Crew Safety Committee Grounding Procedures Handbook* for grounding procedures (available from Transmission and Distribution Safety).

2707 Hook Ladders

A) Inspect all ladders for safety before climbing.

B) Ensure hooks are locked in open position.

C) Lock safety chains on each hook before work begins; secure hook ladders to prevent displacement and use guying as necessary.

D) When working from a hook ladder, use appropriate fall protection equipment (FPE) and work positioning equipment (WPE) as required.

E) Face the ladder when climbing or descending, and maintain three points of contact.

F) Raise and lower materials and tools with a hand line.

G) Avoid leaning over or reaching out farther than arm's length while on a ladder.

H) Ladders must not be moved while occupied by an employee.

l) When carrying ladders on vehicles, make sure they are adequately supported to avoid sagging and securely fastened in position to minimize bouncing or rubbing. Use flags as appropriate to mark the ladder where it extends beyond the vehicle.

2800 Electrical Safety – Substation Operations and Security

2801 Access and Control

A) Anyone entering a substation will:

1) Wear required PPE and approved FR clothing.
2) Sign the logbook with name, date, time and purpose of entry.
3) Report to the person in charge, if present.
4) If appropriate, be briefed on hazards, locations of energized equipment, limits of de-energized work and minimum approach distances.
5) If driving a vehicle, be aware of any low clearances and adjust the vehicle's antenna (as needed).

B) Access to substations is restricted to authorized employees. Any other persons must have continuous supervision by an authorized person.

C) Prior approval shall be obtained from Substation Operations management before storing any PGE or personal vehicles in a substation. Vehicles, construction equipment and material stored in substations must not impede access to any equipment or structure required for the safe and efficient operation of substation.

D) Employees and visitors shall obey all caution and warning signs posted inside substations.

E) Employees and visitors shall not enter any barricaded area unless specifically authorized to do so by a qualified person or designated representative.

2802 Inside a Substation

A) Work groups of two or more shall conduct a pre-job briefing/tailboard prior to the start of each job.

B) **DO NOT** carry materials or tools of any kind on or above the shoulder when working around energized parts. Carry long material, including lumber, horizontally.

C) All employees performing aerial work must be trained in appropriate structure/tower rescue techniques for the work being performed.

D) Individuals within substations or switchyards should be prepared for occasional automatic mechanical/electrical operation(s) of equipment. Operations are often very loud and can alarm unprepared individuals.

2803 Working in Substations (Safety Watch Requirements)

A) A safety watch is required in any Portland General Electric (PGE) substation anytime the possibility that nonqualified persons or equipment could violate the standard minimum working clearances listed below in **Table 2803-1**.

NOTE: Exception: When OSHA-approved barriers are installed to prevent inadvertent contact of energized equipment.

1) Qualified safety watch: A qualified safety watch is a journeyman wireman who knows and has the training to understand the safety rules and electrical hazards involved in specific substation work situations. A safety watch is assigned for the sole purpose of ensuring a safe work environment that complies with all safety rules and regulations for nonqualified individuals working inside PGE-owned energized substations.

2) QWHO training: The PGE employee must pass qualified-worker hands-off training prior to entering an energized substation alone. The purpose of this training is to provide sufficient experience and knowledge to protect employees against electrical hazards.

3) Qualified: A PGE employee who has completed PGE QWHO training or a contractor that has passed biannual mandatory nonelectrical contract worker substation entrance training and exam. Passing either training provides sufficient

experience and knowledge to protect employees against electrical hazards.

4) Safety Watch requirements for PGE nonelectrical qualified personnel (QWHO trained).

   a) A qualified safety watch is not required when nonelectrical qualified PGE employees are working beyond the Standard Working Clearances listed in **Table 2803-1** if their work conforms to PGE working rules for nonelectrical workers.

   b) A qualified safety watch is required anytime nonelectrical qualified PGE employees are working inside the Standard Working Clearances listed in **Table 2803-1**. Nonelectrical qualified employees may encroach up to the Minimum Approach Distances (MAD) listed in **Table 2803-2** while preforming work under the direction of a qualified safety watch.

Table 2803-1. Standard Working Clearances for Nonelectrical Qualified Workers

Nominal Voltage Phase to Phase	Clearance Required
50,000 V and below	10 ft. 0 in
50.1 to 70.0 kV	11 ft. 0 in.
70.1 to 120.0 kV	13 ft. 0 in.
120.1 to 240.0 kV	17 ft. 0 in.
240.1 to 350.0 kV	20 ft. 0 in.
350.1 to 550.0 kV	27 ft. 0 in.
550.1 to 800.0 kV	35 ft. 0 in.
800.1 to 1000.0 kV	42 ft. 0 in.

Table 2803-2. Minimum Approach Distance with Qualified Safety Watch Present

Nominal Voltage Phase to Phase (kV)	Minimum Approach Distance
0.50 to 0.300	Avoid contact
0.301 to 0.750	1 ft. 1 in.
0.751 to 5.0	2 ft. 1 in.
5.1 to 15.0	2 ft. 3 in.
15.1 to 36.0	3 ft. 0 in.
36.1 to 46.0	3 ft. 3 in.
46.1 to 72.5	4 ft. 0 in.
72.6 to 121 kV	4 ft. 8 in.
121.1 to 145.0 kV	5 ft. 5 in.
145.1 to 169.0 kV	6 ft. 5 in.
169.1 to 242.0 kV	10 ft. 2 in.
242.1 to 362.0 kV	18 ft. 2 in.
362.1 to 420.0 kV	22 ft. 5 in.
420.1 to 550.0 kV	27 ft. 1 in.
550.1 to 800.0 kV	37 ft. 5 in.

5) Safety watch requirements for qualified nonelectrical, non-PGE workers:

   a) With OSHA-approved barriers installed, a qualified Safety Watch is not required for nonelectrical, non-PGE workers working beyond the Standard Working Clearances listed in **Table 2803-1** if their work conforms to PGE working rules for nonelectrical workers.

b) A qualified safety watch for qualified nonelectrical, non-PGE workers allows movement of workers and equipment up to the minimum approach distances listed in **Table 2803-2**.

6) Short duration jobs/tasks — Individuals delivering, picking up or servicing equipment including nonqualified PGE employees inside of an energized substation:

a) When inside an energized substation that contains a designated storage area with an approved barrier fence, a nonelectrical qualified employee can escort a contractor for incidental equipment verification and to complete various tasks outlined in the substation operations practice. Also a nonelectrical qualified employee may use a boom inside this area without a safety watch as long as they are trained in equipment grounding and maintain a 50-foot gap from any energized equipment or lines.

7) Longer duration jobs/tasks — For crews performing work inside an energized substation, the qualified safety watch must comply with the following rules:

a) Be present at the jobsite, engaged in the work being performed and available to immediately halt hazardous work.

b) Ensure suitable guards and barriers to isolate unsafe areas have been installed.

c) Ensure equipment has been properly isolated and grounds are on and properly installed (when required) before permitting workers to begin work inside an energized substation.

d) Document daily pre-job meetings, with crew and safety watch per PGE policies and procedures. This documentation will be turned in at the completion of each job to the area supervisor.

e) Ensure that contractors comply with PGE safety policies and practices as well as Oregon OSHA pertaining to the work being performed.

f) The safety watch will immediately stop any contractor or nonqualified workers actions that **DO NOT** meet the above mentioned safety requirements.

2804 Vehicles in Substations

A) If you are required to drive vehicles in substation environments, observe the following safety measures:

1) Stay on established driveways.

2) **DO NOT** drive under or near an electrical bus or device unless safe distances stated in *Section 2805* can be maintained.

3) Be cautious of the height of vehicle antennas when driving in substations.

2805 Clearance for Equipment in Transit in Substations

A) Clearance for equipment in transit on smooth surfaces is a minimum of:

1) 4 feet for voltages less than 50 kV.

2) 10 feet for voltages over 50 kV up to and including 345 kV.

3) 16 feet for voltages over 345 kV and up to and including 750 kV.

B) When visual clearance is difficult, designate a person to observe clearances and give timely warnings.

2806 Substation Ground Grid Repair or Alterations

A) Use a 2/0-AWG copper personal ground copper jumper when making grid repairs or alterations. Energized substation equipment can fail, allowing high current into the ground system.

B) When splicing, cutting or tapping a ground wire, install a 2/0 copper personal ground and 2/0-AWG copper jumper (with a shotgun) to bridge the wires being connected prior to handling wires and making repairs.

2807 Security

A) Security of the substation is the responsibility of the individual unlocking the gate for entrance or exit.

1) All perimeter entrances to the substation, including windows, doors, gates, etc., must be kept locked at all times, unless employees have the entrance directly under their observation and can prevent entry by unauthorized persons.

2) The last person to leave the substation has the responsibility to make certain that all gates and entrances are locked, secured and alarmed (if applicable).

3) If any indication of forced entrance, vandalism or breach of security is discovered, immediately notify the System Control Center/Load Dispatcher (503-464-8343) and Corporate Security (503-464-8600).

2900 Electrical Safety – Underground Installations

A) Refer to *Section 1803, Enclosed Space Entry Procedures,* for proper entry procedures for underground electrical installations.

2901 Switching Underground Circuits

A) Follow PGE switching and tagging procedures when performing switching on underground systems.

B) Use an approved switching method when switches in an energized circuit are opened or closed.

2902 Working on Underground Cables

A) Moving energized cables: Only qualified employees shall inspect for defects and move cables.

B) Multiple cables:

1) Use appropriate electrical testing methods to identify which cable is to be worked unless it can be identified by its distinctive appearance or location.

2) Protect cables that are not being worked from damage. Install approved covers over cables for safety.

C) Defective cables: If abnormalities found in a cable could lead to a fault, de-energize and properly ground the defective cable or splice before work begins.

1) Abnormalities/defective cables are defined as: Oil compounds leaking from cables or joints, broken cable sheaths on joint sleeves, hot localized cable surface temperatures on joints, or joints that are

swollen beyond normal tolerance. These are presumed to lead to or be indications of impending fault.

D) Sheath/concentric continuity: When working on buried cables or cables in manholes, maintain metallic sheath continuity or treat cable sheathes as energized.

E) Cable identification:

1) **DO NOT** work on any cable until it is positively identified.

2) Remove and attach cable tags or markers only with approval of a supervisor or qualified employee.

3) Remove existing cable tags or markers only after new tags or markers are in place.

F) Cutting cable: Prior to working on the cable, identify, isolate, test and ground the conductor. Grounding may occur by using a standoff and grounding jumper or by spiking with an approved device, such as hot cutters. Cables should be cut remotely from outside the workspace during this procedure.

G) Riser cable installations:

1) Follow all safety rules when working on poles carrying energized conductors and equipment.

2) After a cable is identified, isolated, tested and grounded, wear appropriate PPE during assembly of termination.

3) Ensure cable splicers' platforms are equipped with safety rail and toe boards.

2903 Raising/Lowering Materials

A) Use equipment capable of supporting the weight of materials and tools being raised or lowered.

B) Check equipment for defects before use.

C) Before lowering hot solder or other hot compounds, make sure employees working in a manhole or vault are clear of the area directly under the opening.

2904 Torches and Pots

A) Operate torches and pots only if properly trained.

B) **DO NOT** light torches or pots within enclosures such as manholes, truck cabs, empty barrels or in atmospheres containing flammable vapors and/or gases.

C) Never use windbreaks enclosed on all sides.

D) When using torches and pots in manholes, provide adequate ventilation for employees and for combustion.

E) Never leave torches unattended or located where they could cause fire.

F) Preheat and dry ladles before use. **DO NOT** use cold or wet ladles when handling molten metals.

2905 Duct Rods and Fiberglass Snakes

A) Minimize hazards:

1) Install duct rods in a direction that poses the least hazard to maintain clearances.

2) Station a qualified person, foreman, or approved employee at the far end of the duct line being rodded to ensure required clearance distances are maintained in energized areas.

3000 Electrical Safety – Working Alone on Exposed Energized Equipment

A) Not less than two qualified workers shall be required for work on equipment energized above 600 V. A qualified 'hot' apprentice may work in place of one of the qualified workers for training purposes.

B) Exceptions – the following exceptions to the two-worker rule apply:

1) When re-fusing circuits with a hot stick.

2) When operating switches by means of operating handles or switch sticks.

3) Where life or public safety is in immediate danger, one worker may remove only the immediate hazard if no other workers are immediately available.

4) When installing or removing a hot line clamp connection with an approved hot stick on single-phase line or apparatus, providing that the connection or disconnection does not interrupt or pick up a load.

5) When a qualified 'hot' apprentice is assigned to work with a journeyman for training purposes.

C) See also *Section 1600 — Working Alone*.

3100 Fall Protection (Six for Safety)

3101 Fall Protection Requirements

A) Fall protection may be required in a variety of PGE work areas, wherever the following are present: ramps, runways and other walkways; excavations; hoist areas; holes; formwork and reinforcing steel; leading edge work; unprotected sides and edges; precast concrete erection; wall openings; residential construction; and other walking/working surfaces.

B) Fall-arrest equipment, work-positioning equipment or other fall protection equipment shall be used by employees working at elevated locations more than 4 feet (1.2 meters) above ground on poles, towers or similar structures.

C) Employees working aloft in an aerial lift or on platforms supported by lift equipment shall wear a full body harness and be attached with either a retractable or shock absorbing lanyard. Employees should ensure their harnesses fit properly.

D) Follow all fall protection requirements specific to work practices for your department. Some general rules:

1) Use a railing, toe board or a floor hole cover to guard any floor opening into which a worker can accidentally fall.

2) Provide a guardrail and toe board around every open-sided platform, floor or runway that is 4 feet or higher off the ground or next level.

3) Regardless of height, if a worker can fall into or onto dangerous machines or equipment (such as

a vat of acid or a conveyor belt), guardrails and toe boards must be used to prevent injuries.

4) Other means of fall protection that may be required on certain jobs include safety harness and line, safety nets, stair railings and handrails.

5) Suspension trauma safety straps should be included with all safety harnesses. Suspension in a harness may cause blood to pool in the veins of the legs which can result in unconsciousness; if not rescued promptly, serious injury or death may occur.

3102 Care of Fall Protection Equipment

CAUTION: If any of these conditions exist, the defect must be corrected before use. **DO NOT** use defective equipment.

A) Inspect body harnesses, lanyards, lifelines, body belts and safety straps daily and/or before each use to ensure safe working conditions. Defects can include, but are not limited to, the following:

1) Cuts, tears, fraying and chafing.

2) Physical deterioration, including damage by ultraviolet light, electrical burns and chemicals.

3) Worn connection devices.

4) Evidence of shock loading.

5) Partial activation of an energy-absorbing device.

6) Wear on snap-hooks, including cracks, burns, corrosion and excessive side movement of the snap-hook keeper (spring tension).

B) In addition, inspect body positioning straps and rope lanyards for:

1) Exposure of colored wear-warning inner layer.

2) Elongation of holes in positioning strap material.

3) Loose or worn rivets, CAMs, chokers, and/or pole grippers.

C) Inspect pole climbers for:

1) Fractured or cracked gaffs or leg irons.

2) Wear on stirrup and leg irons.

3) Loose or dull gaffs.

4) Properly sharpened gaffs.

5) Broken straps or buckles.

6) Set screws that are in place and tightened.

7) Velcro fasteners are properly secured as appropriate.

D) Tag any fall protection equipment suspected of shock loading as “Do Not Use” and return to a supervisor.

E) Remove from service any equipment subjected to a fall until it can be inspected and certified by a competent person.

3200 Fleet Safety

A) Safety rules in this section apply specifically to Fleet and Garage Operations. More general safety rules related to motor vehicle operations, flammable materials storage and disposal and general housekeeping found elsewhere in this manual apply to fleet safety as well.

B) Work done in this department involves nearly all phases of automotive trades. Fleet and Garage Operations employees may frequently find it necessary to refer to more detailed instruction manuals from various automotive manufacturers to perform their jobs. Manufacturer's safety recommendations are to be considered a part of the rules in this manual.

3201 Fleet Safety Guidelines

A) Materials handling:

1) Unit assemblies, sub-assemblies, heavy metal parts, etc., shall be carefully blocked and never left on or near the edge of a table or bench where there is a possibility of it falling off or being knocked off and causing injury.

2) Portable floor cranes will not be loaded to the point where additional ballast is required.

3) Store heavier parts where lifting strain is minimized.

B) Vehicle movement in garages:

1) Vehicles will be driven at or below posted speeds within a garage. All vehicles must stop at the door

before entering or leaving to verify clearances. Special attention shall be given to warn pedestrians.

2) When backing out of the garage, a guide should always be used when available. If no guide is available, a vehicle walk-around will be performed immediately prior to backing out of garage.

3) If a vehicle cannot be moved under its own power, it shall only be moved if adequate equipment or personnel is available. No single employee will attempt to push a vehicle.

C) Vehicle repair:

1) **DO NOT** operate a vehicle or equipment engine in a closed area unless attached to flexible exhaust extensions. If the engine is to run above idle for an extended period of time; use a metal exhaust extension.

2) When two mechanics are working on a vehicle, avoid injuring fingers when closing car doors or hoods or stepping on running boards. Maintain constant communication to prevent injury to either party.

3) **DO NOT** depend on jacks alone when working on or under a vehicle. Always use stands and wheel chocks.

4) Whenever possible, use creepers for all work that requires lying on your back under a vehicle.

5) Use a wheel dolly when removing wheel and brake drum assemblies.

6) Jumping off truck platforms is prohibited.

7) No vehicle shall be tested or adjusted when in gear until appropriate measures have been taken to prevent uncontrolled vehicle movement. Use parking brake or chocks.

8) Fall protection is required when working at or above 6 feet. When working in an elevated aerial lift, use fall protection that is attached to the boom.

D) Lubrication/fluids:

1) Take care to avoid cuts from sharp or rough edges while greasing a vehicle.

2) Wipe off all joints to prevent excess oil or grease from falling on the floor.

3) Take care when adding fluids. Clean up spills immediately.

E) Vehicle washing:

1) Washing areas are slippery. Be careful to avoid falls and minimize slipping hazards.

2) Take care to avoid cuts from sharp or rough edges when washing a vehicle.

3) Use extreme caution when any drop cords or other electrical equipment is used in wash areas. Only GFCI-protected equipment in good condition shall be used.

4) Wear safety glasses, goggles or face shields when washing cars or operating steam cleaners or high-pressure washers.

F) Truck and car lifts:

1) All truck and car lifts shall be inspected regularly and shall not be used if there is any doubt about their condition. Take care not to overload the rated capacity of lifts.

2) Operators shall make sure the immediate area of a lift is clear of all persons and equipment before raising or lowering the lift.

3) Set manual safety locks before working on or under any vehicle, when applicable.

G) Lube pits:

1) Take care to keep lube pits clean of accumulated oil, gasoline, grease and dirty rags.

2) Keep all tools in their proper location in the pit.

3) Pit stairways will be kept clear and unobstructed at all times.

4) Safety barriers shall be in place when lube pits are not in use.

H) Paint shop:

1) Painting equipment shall only be operated by employees trained to use such equipment.

2) Turn blowers on in paint booths when spray painting.

3) Keep spray painting areas clean at all times.

4) Keep all thinners and cleaners in approved closed containers.

3202 Working in Remote Locations

A) A radio or cell phone shall be taken when going on a road call.

B) Consult and follow site specific safety rules when entering a local jobsite. This includes wearing of specific PPE.

C) After entering a jobsite, close and lock the gate (this applies to remote service centers).

D) If a job becomes too large or unsafe for one person, arrangements shall be made to send help or set up a new date to complete the job.

E) After completing work at one site, inform the Garage of your departure before traveling to another site.

F) When working for an extended period of time at one location, periodically update the Garage of your status.

G) Be sure you know emergency procedures for working at any remote location.

H) See also *Section 1600 — Working Alone*.

3300 Hazardous Materials

3301 General Guidelines

A) Always follow manufacturer's recommendations and any specific process or job documents available for instructions on proper use of chemical products.

B) Before handling a chemical for the first time, consult its Safety Data Sheet (SDS) for specific precautions and instructions to become acquainted with its potential hazards.

C) SDS for all hazardous chemical products in the company inventory are maintained in a software system database (Dolphin) found at http://rtk.complyplus.com/frame.asp. Access the Dolphin database from the Safety Data Sheets link on the company intranet home page. If you cannot locate an SDS, ask your supervisor, safety coordinator or PGE Safety & Resiliency – Industrial Hygiene for assistance. If necessary, you may call Dolphin directly at 1-800-275-6737 (MSDS). (See *Section 3304* for more information on SDS.)

3302 Handling/Storage Guidelines

A) Before working with any chemical, employees must:

1) Complete training on PGE's Hazard Communication Program. Training will cover:

a) The specific hazards of the products they work with, and how to read chemical labels and SDSs.

b) Appropriate PPE for their jobs, including limitations, proper selection, use and care.

c) Safe storage and transport of hazardous materials.

d) Emergency procedures for chemical exposure or releases.

2) Review information on chemical labels and applicable SDSs necessary to perform assigned work task(s).

3) Understand hazards involved and any limitations of using of the chemical.

4) Use hazardous chemicals only for prescribed purposes and only in the manner intended. Contact your safety coordinator or PGE Safety & Resiliency to obtain a hazard evaluation if uncertain about chemical hazards.

5) Be familiar with and follow procedures as required by PGE process documents.

6) Wear proper PPE when handling chemical products whenever there is the possibility of contact with chemical liquid, dust or vapor. PPE may include, but is not limited to:

a) Eye protection.

b) Chemical gloves rated for the material.

c) Splash protection.

d) Respiratory protection (if needed).

NOTE: For information on the selection of PPE, consult applicable procedures, the SDS, your supervisor or contact PGE Safety & Resiliency.

7) Minimize generation or use of hazardous material. Use alternate, less toxic materials whenever possible.

8) Wash hands and face after handling hazardous materials and before consuming food or tobacco products.

9) Exercise caution to avoid hazard materials on customer property. Follow all hazard warnings and instructions from the customer or customer representative.

B) Employees shall not handle corrosive materials unless there is access to an adequate water drenching system (a fixed or portable safety shower/eyewash station) for quick flushing of the eyes and body. Fixed facilities must be tested for proper operation before work begins.

C) Only approved methods, tools and equipment shall be used to draw out chemicals from a container.

1) Compressed air shall be used only when the container was designed to be used with the compressed air chemical-transfer method.

2) Siphoning by mouth is prohibited.

3) Chemical pumps and lines shall be flushed internally where possible and washed externally

with water before repacking or having maintenance work performed.

D) Properly dispose of all chemical products and chemical containers. Even when empty, containers can have hazardous residues.

1) **DO NOT** pour any chemical products down sink drains, storm drains or onto the ground.

2) When empty, all small acid containers, such as bottles and jars, must be triple-rinsed with water.

3) Contact Environmental and Licensing Services (503-464-8970) for proper chemical and chemical container disposal procedures.

E) Chemical storage areas should be maintained such that incompatible materials are well contained and segregated from other materials they could react with.

NOTE: For support in determining chemical compatibility, contact PGE Safety & Resiliency.

1) Chemical products shall not be stored near heaters, steam pipes or other heat sources.

2) Chemical products should be secured in vehicle beds during transit. **DO NOT** carry chemicals or flammable materials in the cab of a vehicle.

F) Only qualified employees shall be assigned the duty of operating valves or other equipment that control movement of hazardous chemicals.

G) Open flames and smoking are prohibited when working with or near flammable or combustible chemicals and

when working with or near acid in metal containers such as tanks, condensers or boilers.

H) Loading/unloading tank cars/trucks:

1) Before loading/unloading chemical tank cars/trucks, prominently post warning signs and place barricades to inform all nearby individuals of possible danger.

2) Before unloading, first gauge that the receiving tank's capacity is adequate.

3) Verify a tank car's or truck's contents by checking the bill of lading before unloading into a receiving tank.

4) Once drained of chemicals, **DO NOT** wash carboys, steel drums or tank trucks/cars, but be sure they are properly labeled before returning to the supplier.

I) Corrosives/acids/caustics:

1) Corrosives kept on shelves shall not be stored higher than waist level.

2) When mixing corrosives (acids or caustics) with water, the corrosive should be poured slowly into the water; water should not be poured into the corrosive except when adding distilled water to batteries.

J) Compressed gases:

1) Compressed gas cylinders must be stored upright and secured with valve caps in place.

2) Cylinders of acetylene, hydrogen or cryogenic liquids (DOT-4L cylinders) must be securely transported in upright position only.

K) Flammables:

1) Use only DOT- or OSHA-approved "safety cans" for gasoline.

2) Flammable liquids must be stored in rated flammable storage cans or flammable storage cabinets.

3) When transferring flammable liquids, the containers should be properly bonded and grounded.

4) Spark-proof or intrinsically safe tools and equipment shall always be used where there is danger of accumulated flammable vapor or gas.

L) Ventilate the workplace to prevent/reduce the buildup of air contaminants.

3303 Labeling and Identification

A) ALL chemical containers must be labeled to alert the user of contents and any potential hazards of the product. If products are transferred from their original container to a secondary container, the secondary container must be labeled with the product name and a hazard warning statement.

B) Oregon OSHA requires the following information be present on all primary chemical labels:

1) A product identifier.

2) A signal word.

3) A hazard statement.

4) A pictogram.

5) Precautionary statements.

6) The supplier's name, address and telephone number.

C) National Fire Protection Agency (NFPA) and the Hazardous Material Identification System (HMIS) labels use both a color-coding system and numerical rating system to indicate the type and severity of hazards presented by the material.

1) The color designations are:

a) BLUE (Health)

b) RED (Fire)

c) YELLOW (Reactivity)

d) WHITE (Additional Information)

2) An example of the NFPA diamond:

3) Numerical designations range from 0 (or blank) to 4 and represent:

a) 0 = Minimal Hazard

b) 1 = Slight Hazard

c) 2 = Moderate Hazard

d) 3 = Serious Hazard

e) 4 = Severe Hazard

4) An example of the HMIS label:

D) Department of Transportation (DOT):

1) The DOT labeling system for packages, freight containers and transportation vehicles uses symbols and a United Nations/North American (UN/NA) numbering system to represent hazards associated with a particular material. These are required on most transported packages and must be printed on or affixed near the marked shipping name.

2) Emergency response information pertaining to DOT labels, symbols and numbers can be found in DOT's Emergency Response Guidebook; copies are available at the System Control Center, in plant control rooms and from PGE Safety & Resiliency. The guidebook provides:

   a) Lists of hazardous chemicals by name and UN/NA identification number.

   b) Information on handling hazardous material incidents.

   c) Guidance on initial phases of emergency response.

   d) Information on fire, explosion and health hazards of substances.

   e) Isolation/protective action distances for specific chemicals.

3304 Safety Data Sheets/Chemical Purchasing Process

A) SDSs provide information about how to contact chemical manufacturers, product ingredients, chemical hazards, safe storage and handling, first-aid measures, proper disposal methods, spill response and recommended firefighting procedures.

B) An SDS must accompany or precede every initial shipment of a chemical product to a PGE site; if SDSs are revised by manufacturer, a copy of a revised SDS must accompany the next shipment of the product.

   1) If there is any difficulty in obtaining an accurate SDS, requests for support can be made to PGE Safety & Resiliency.

   2) If information on new chemicals is needed immediately, first contact PGE Safety & Resiliency, then contact Environmental and Licensing Services.

C) Site managers/designees shall ensure all chemical products used or stored by PGE facility are on the facility's site chemical inventory and have current SDSs in the SDS database.

D) If an SDS is found to be missing any required sections, notify PGE Safety & Resiliency as soon as possible. PGE Safety & Resiliency will ensure the manufacturer is contacted to complete the SDS.

E) Approving a new chemical before use:

   1) Prior to using a new chemical at any PGE location, an SDS Request/Submittal Form must be completed and submitted to Environmental and Licensing Services, along with PGE Safety & Resiliency for review (see My Workplace > Forms).

      a) Before submitting the form, review the SDS database to ensure the chemical product is not already in the system and determine whether

there is a similar product in the system that meets company needs.

b) Once submitted, SDS Request/Submittal Forms will be reviewed by PGE Safety & Resiliency and Environmental and Licensing Services for inclusion in PGE's SDS Database.

c) In an emergency, if a new chemical product that has not been previously approved is required, the product may be purchased outside the above process with prior supervisory approval. An emergency is defined as an unforeseen event that will result in interruption of business operations. If this occurs, a copy of the SDS should be made available for review at the location the chemical is being used until an SDS Request/Submittal Form can be completed and the product added to SDS database.

3305 Spills and Releases

A) Releases or spills of hazardous materials can potentially pose serious health and safety risks. There are two types of hazardous materials incidents:

1) Incidental releases – Incidental chemical releases are spills of small quantities of known materials that occur during the course of typical work activities. Employees who have received hazard communication training and who are equipped with appropriate PPE may clean up incidental spills if it can be done without placing themselves or their co-workers at risk.

2) Hazardous material emergencies – Spills involving unknown materials, reactive chemicals, large quantities of chemicals, releases to waterways, uncontrolled releases, fire, chemical exposures or injuries are NOT considered incidental and should be treated as hazardous material emergencies. These require support from an outside resource, i.e., a vendor or the state's Regional Hazardous Material Response Team.

B) For hazardous materials releases or spills, PROTECT YOURSELF FIRST and the environment second. Protect property and equipment, if it can be done safely. Notify the System Control Center at 503-464-8343 or the plant Control Room for assistance in evaluating the situation and requesting proper response.

C) When trying to identify the material spilled or released:

1) Approach incident from an upwind direction, if possible.

2) Move people away from the area.

3) **DO NOT** walk on or touch spilled material.

4) Avoid inhalation of all gases, fumes and smoke.

5) Never assume that visible gases or vapors are harmless because they are odorless.

6) For more information, consult the Hazardous Material Emergency Response Plan for the site where you work: https://mypge.corp.dom/wps/myportal/mypge/our-company/our-commitments/safety/hazardous-materials-emergency-response-plans.

3306 Storage/Transportation of Compressed Gas

A) Cylinders of compressed gas must be received and maintained with legible, DOT-compliant labels that includes product name and hazard warnings. Replacement labels must be requested from supplier.

B) Cylinders stored inside of buildings will be:

1) Well-protected in well-ventilated and dry locations at least 20 feet from highly combustible materials such as oil or excelsior.

2) Stored in specific assigned places away from elevators, stairs, or gangways; or areas that are subject to tampering by unauthorized persons.

3) Secured with noncombustible bindings in upright positions, regardless if empty or full, with bindings located about three-quarters of the way up the cylinder from the floor.

4) Stored with valve caps or valve protection devices in place at all times, even when empty. Acetylene and liquefied fuel gas cylinders should be stored with valve end up.

C) Empty and full cylinders will be stored separately. Tag empty cylinders “EMPTY” or “MT” to avoid confusion.

D) Inside a building, cylinders, except those in actual use or attached ready for use, shall be limited to a total gas capacity of 2,000 cubic feet (56 m(3)) or 300 pounds (135.9 kg) of liquefied petroleum gas.

E) Keep gas cylinders upright when handling. **DO NOT** roll, drop or jar cylinders or lift them by valve caps or protective caps. Use appropriate hoisting devices to lift cylinders.

F) Transport cylinders in an upright position or in a rack that meets DOT specifications whenever possible.

G) **DO NOT** transport cylinders without removing the regulators.

H) Cylinders shall not be placed where they might accidentally make contact with energized equipment.

I) **DO NOT** force connections that do not fit, nor modify or tamper with safely relief devices or cylinder valves.

J) Special precautions:

1) Flammable gases. Hydrogen or other flammable gases require care to avoid possibility of fire and explosion. Hydrogen and fuel-gas cylinders will be stored in separate storage buildings or sheltered storage areas. "Danger - No Smoking" signs must be posted where hydrogen or other flammable gases are used or stored.

2) Oxygen cylinders, when not in use, must be stored separately from fuel-gas cylinders or combustible materials (especially oil or grease) by a minimum

distance of 20 feet or by a 5-foot-high fire-resistant barrier with a rating of at least 30 minutes.

3307 Transporting Hazardous Material

A) The DOT has published regulations that must be followed when transporting hazardous materials.

1) A hazardous material is any substance or material that is capable of posing an unreasonable risk to health, safety and property when transported in commerce.

2) Hazardous materials are classified as:

a) Explosive

b) Flammable

c) Corrosive

d) Poisonous

e) Infectious

f) Radioactive

B) To transport hazardous materials, the company must comply with state/federal regulations, which require:

1) A specific manner of packaging, labeling and loading of the material onto vehicles.

2) Shipping papers to be filled out and carried by the driver (if applicable).

3) Vehicle placarding (if applicable).

C) Materials of Trade (MOT):

1) DOT has provided exemptions from some of these requirements if hazardous materials are considered “Materials of Trade,” that is a material that supports our business and is exempted from some of the regulations that apply to the use of hazardous material in other situations.

2) MOTs are hazardous materials carried on a motor vehicle for at least one of the following purposes:

   a) To protect the health and safety of the motor vehicle operator or passengers. Examples include insect repellant, fire extinguishers.

   b) To support the operation or maintenance of a motor vehicle or auxiliary equipment. Examples include engine starting fluid, gasoline.

   c) (When carried by a private motor carrier) to directly support a principal business that is not transportation. Examples include lawn care, welding, painting.

3) To comply with MOT regulations, employees must know the following:

   a) Which materials are being shipped.

   b) Why materials are MOT.

   c) Quantity limitations.

4) Hazardous materials can only be considered MOT if they are under a certain quantity – less than 440 pounds. If more than this amount, the material

cannot be classified as MOT and so shipping papers must be completed for the material.

a) Shipping paper must cover only materials that make up the excess over 440 pounds.

b) At PGE, we try to classify hazardous materials as MOT whenever possible, splitting loads if necessary.

D) Packaging, labeling and marking:

1) All hazardous materials must be labeled even when moved from its original container.

a) Cylinders and pressure vessels must be marked with proper shipping name, ID number and hazard class label.

b) Packages containing reportable quantities of a hazardous substance must be marked “RQ.”

E) Shipping papers, manifests and placarding:

1) Shipping papers must be completed when shipping hazardous materials that don’t qualify as MOT, e.g., weight exceeds 440 pounds, or a bulk quantity container has greater than a 119-gallon capacity (requiring vehicle placards).

2) Other shipping paper requirements:

a) Carriers must have a copy prior to transporting.

b) Papers must accompany the vehicle.

c) Papers must contain an emergency response phone number.

d) The preparer must retain a copy for two years (three years for hazardous waste)

3) PGE also requires completion of its Transporting Materials and Equipment Form (PGE Form 0080) when the following materials are transported, regardless of amount:

   a) Oil-filled electrical equipment.

   b) PCB-containing waste (soil and rags)

   c) Or whenever transportation is from the field to a PGE temporary storage site (PGE service center) or from a temporary storage site to PSC (long-term storage for disposal site).

4) For information on how to obtain and complete a shipping paper, contact PGE Safety & Resiliency – Industrial Hygiene or Environmental and Licensing Services.

5) Placarding a vehicle is required when the amount of the hazardous material:

   a) Exceeds 1,001 pounds or

   b) The bulk container capacity is greater than 119 gallons.

6) Placard guidelines:

   a) The driver of a placarded vehicle transporting hazardous materials must have a Hazardous Materials Endorsement on their CDL.

   b) Placards must be placed on each side of the vehicle and on each end.

c) If a material requires a placard, it also requires shipping papers.

d) Placarded vehicles must carry a shipping paper and an updated copy of a Federal Hazardous Material Registration form. This form is available on the myPGE Forms page or through Environmental and Licensing Services.

7) Special exemptions are available for transporting plant batteries. Placarding and shipping papers are not required when the following conditions are met:

a) No other hazardous materials are being transported in the same vehicle.

b) Batteries are secured during shipment to prevent damage or short circuits in transit.

c) Any other materials are blocked, braced or secured to prevent contact with or damage to the batteries.

d) The transport vehicle is not carrying material shipped by any person other than the shipper of the batteries (applies to shippers only).

8) Uniform hazardous manifests:

a) These manifests are required for all shipments of hazardous waste and for disposal of PCB-contaminated equipment and waste containing more than 50 ppm PCB.

b) PGE employees arranging disposal of hazardous waste and PCB-containing waste

are responsible for reviewing and signing the hazardous waste manifest as the “generator” of the waste.

i) Even if the disposal vendor fills out this paperwork, the employee must review and sign as the “generator/offeror” of the waste.

c) Additional training on the use of manifests is required before you can become qualified to review and sign one of these forms.

i) If you are asked to sign one of these documents and have not been trained to do so, contact Environmental and Licensing Services (503-464-8970) for assistance.

9) Additional manifest information:

a) PGE must retain a copy of the manifest for three years.

b) The generator will receive the generator’s initial copy (for company records) at the time of shipment.

c) The designated facility has 35 days after receiving the waste to send the generator the final signed copy of the manifest.

d) Environmental Compliance and Licensing maintains copies of all manifests and supporting documentation.

10) Restricting access to hazardous loads:

   a) Drivers are responsible for ensuring the security of the load during transport and until delivery.

   b) Containers of hazardous materials should always be placed in locked storage bins on the transport vehicle.

   c) Vehicles should always be parked in secured locations, inaccessible to unauthorized and untrained personnel.

   d) Vehicles should always be attended if storage bins are unlocked (for example, while being accessed).

11) Safe transport checklist:

   a) Conduct a pre-trip safety inspection.

   b) Verify that all hazmat is properly marked, labeled and secured in place.

   c) Verify that shipping papers are completed, if required.

   d) Verify that vehicle is properly placarded if required.

   e) Check for incompatible materials.

   f) Keep unattended vehicles secured at all times.

   g) Keep phone or radio available at all times.

   h) Notify the System Control Center immediately of any security concerns.

   i) Report missing materials immediately.

F) PGE's Hazardous Materials Security Plan exists to keep our employees, property and the environment safe. The plan covers:

1) Employee training on safe handling of hazmat and complying with federal regulations.
2) Restricting access to hazmat.
3) Protocols for ensuring safety when transporting hazmat.

NOTE: Hazmat sections on pole treatment chemicals, organophosphate chemicals and chlorine have been removed from this safety manual. Consult the appropriate SDS before handling these chemicals.

3400 Locates, Excavating, Trenching and Shoring

A) PGE employees who excavate land as part of their jobs must first notify the Oregon Utility Notification Center (811) and follow all “locate” procedures. By predetermining the locations of underground utilities, employees can ensure their safety and that of co-workers and customers on the work site.

3401 Procedures for Locates

A) At least two business days, but not more than 10 business days, before commencing an excavation, an excavator shall notify the Oregon Utility Notification Center of the date and location of the proposed excavation and the type of work to be performed.

B) An excavator may provide less than two business days’ notice when:

1) Responding to an emergency, so long as the excavator notifies the Oregon Utility Notification Center immediately and so long as the excavator takes reasonable care to protect underground facilities.

2) There is an agreement with each operator of underground facilities that marks will be provided on a regular basis as the excavator progresses through a project.

3) An underground facility is discovered in an area where the operator of that facility had previously indicated there were no facilities.

C) Marking of underground facilities:

1) Within two business days after the excavator notifies the Oregon Utility Notification Center of a proposed excavation, the operator or its designated agent shall:

a) Mark with reasonable accuracy all locatable underground facilities within the area of proposed excavation. "Reasonable accuracy" means a location within 24 inches of the outside lateral dimensions of both sides of an underground facility.

b) Mark approximate locations of un-locatable underground facilities in the area of proposed excavation. Marks are good for 10 days.

c) Notify the excavator, via email, phone or fax, when there are no underground facilities in the area of the proposed excavation.

2) In areas of continuing excavation or construction, operators shall mark newly installed underground facilities immediately upon placement.

3) An operator of underground drainage lines is not required to indicate the presence of those facilities if the existence and route of those facilities can be clearly determined from the presence of other visible facilities, such as manholes, catch basins, inlets, outlets, junction boxes, storm drains or permanent marking devices.

D) Once underground facilities have been marked, the excavator shall:

   1) Maintain marks during the excavation period to ensure that the original marks remain effective for the life of the project and can be re-established.

   2) Stop excavating in the vicinity of the underground facility and request re-marking, if markings are no longer visible.

   3) Employ hand tools or other non-invasive methods to determine the exact location of the underground facility when excavation is to be made within the reasonable accuracy zone. “Non-invasive” means exposing an underground facility without damaging any part of the facility.

E) Once underground facilities have been located and exposed, the excavator shall:

   1) Provide lateral and subjacent support for underground facilities as may be reasonably necessary for their protection.

   2) Notify a facility operator immediately if damage occurs or is found. If the damage results in a release of natural gas, the excavator shall call 911 immediately and take reasonable steps to ensure public safety. The excavator will not bury damaged underground facilities without the consent of the operator.

F) If an excavator discovers underground facilities in an area where an operator previously stated there were none, the excavator shall, prior to continuing

excavation, notify the Oregon Utility Notification Center. After providing notification, the excavator shall use extreme care in the affected area.

G) If an excavator is informed that a critical facility, as determined by the operator, is in the area of excavation and that an operator-provided monitor is required on site during the excavation, the excavator must not begin excavation without that monitor or without the facility operator's consent. The scheduling and fulfillment of this monitoring may not interfere with or delay the work.

3402 Excavating/Trenching/Shoring

A) Excavation requirements:

1) Ensure locates are in place prior to excavation work proceeding.

2) Verify all service feeds from buildings and homes and that they have been located and/or they are aerial.

3) Photograph the marked facilities for future use.

4) Check for any visible signs of pedestal, riser or new trench lines that have not been marked in your dig area.

5) When possible, check to make sure that the dig area is defined and is the same on the job sketch.

6) Check for any private facilities not located. If they are not located, contact Line Dispatch or your supervisor to get them located.

7) If there are high-priority facilities in your dig area, make sure the facility owner/locator is on the jobsite and/or has been contacted for advice.

B) While excavating:

1) A competent person must be present for all excavations. A competent person is defined as one who is trained and qualified in identifying existing or predictable hazards, e.g., determination of Soil Types A, B, C, sloping requirements, surroundings or work conditions, and who is authorized to take prompt corrective measures to eliminate them.

2) If paralleling or working on a critical or high-priority line, pot hole to expose and verify location and depth of facility every 50 feet.

3) Hand dig or use noninvasive means within 24 inches of lines, peds, pole risers, meters or other structures.

4) **DO NOT** place excavated dirt on locate marks, flags, whiskers, etc.

5) Support all lines exposed during excavation to avoid kinks or other damage.

6) When backfilling, shade all lines placed or exposed with good fill dirt.

7) Verify all fill dirt is free from rocks, cable trash, crew trash and large dirt clods.

8) Protect, support or remove underground installations as necessary to protect workers while the excavation is open.

9) Employees are never permitted under loads handled by lifting or digging equipment, or in any area where accidental release of loads could cause injury.

10) Surface encumbrances, such as trees, poles, signs, landscaping boulders, padmount equipment, regulator stations, etc., shall be removed or supported as necessary.

11) For excavations greater than 4 feet in depth:

    a) The excavated area must be monitored with a gas monitor where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby.

    b) A stairway, ladder, ramp or other safe means of egress shall be located in the trench, so as to require no more than 25 feet of lateral travel.

12) For excavations greater than 5 feet in depth:

    a) Shoring or other safeguards must be employed as determined by the competent person on site.

C) Employees exposed to vehicular traffic while excavating or on an excavation site shall wear warning vests or other suitable garments that meet ANSI 107 requirements for high-visibility safety apparel.

D) When mobile equipment is operated adjacent to an excavation or when the operator of such equipment is

required to approach the edge of an excavation but does not have a clear and direct view, a warning system shall be used, such as barricades, hand or mechanical signals or stop logs. If possible, the grade should fall away from the excavation.

E) Emergency rescue equipment: A safety harness, rescue line and a rescue tripod or similar device must be readily available when hazardous conditions exist or could develop.

F) Water accumulation protection:

1) **DO NOT** work in excavations where there is standing or accumulating water unless adequate precautions are taken to mitigate water accumulation hazards.

2) A competent person shall monitor pumps when used to control or prevent water accumulation.

G) If work interrupts natural drainage of surface water (e.g., streams), use dikes, diversion ditches or other suitable means to provide temporary drainage and minimize or prevent surface water from entering excavations. Excavations subject to runoff from heavy rains must be inspected by a competent person.

3403 Inspections/Requirements for Protective Systems

A) A competent person must daily inspect excavations, adjacent areas and protective systems for situations that could cause cave-ins, failure of protective systems, hazardous atmospheres or other unsafe conditions.

1) This inspection will be conducted before the start of work and as needed throughout a shift.

2) Inspections shall be made after every rainstorm or other hazard-increasing occurrence.

B) If evidence of potential hazards is found, remove employees from the area until necessary precautions are taken to ensure safety.

C) Fall protection:

1) Walkways are required where employees or equipment will be crossing over excavations.

2) Guardrails shall be provided where walkways are 6 feet or more above the lower levels.

3) Adequate physical protection (barriers) will be provided at unattended excavations.

4) Barricade or cover all open wells, pits, shafts, etc., then backfill after completing exploration or similar operations.

D) Employees must not work on faces of sloped or benched excavations at levels above other employees unless they are adequately protected from hazards of falling, rolling or sliding material or equipment.

E) Employees must be protected from cave-ins by an adequate protective system, except when excavations are made entirely of stable rock or are less than 4 feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

F) Protective systems:

1) Must be able to resist intended loads without failing and be free of defects that might impair proper function.

2) If damaged, should be examined by a competent person to determine if it can still be used.

3) Should be removed while an excavation is being backfilled.

3500 Lockout-Tagout and Hazardous Energy Control (Six for Safety)

3501 Hazardous Energy Control

A) Lockout-Tagout (LOTO) is a mandatory systematic process for isolating, controlling and eliminating hazardous energy before working on equipment that could accidentally start up, move or release energy and seriously injure workers.

B) Lockout-Tagout applies to all types of hazardous energy sources, including:

1) Electrical
2) Mechanical (springs, reels, stored tension)
3) Gravity (objects that could fall)
4) Hydraulic (fluid and/or water pressure)
5) Pneumatic (air pressure)
6) Thermal (steam)

NOTE: When marked with green “Special Conditions” tags, equipment is not considered part of the LOTO program.

C) Follow all switching and tagging procedures for your site and/or operations to ensure safe isolation of applicable energy sources.

3600 Microwaves/Radio Frequencies/Fiber Optic Cable

3601 Safe Work Practices around Radio Frequencies

A) Follow these safe work practices when working near or on a transmitting antenna:

1) Obey all posted signs.

2) Assume all antennas are active.

3) **DO NOT** remain in front of transmitting antennas.

4) Use a personal radio frequency safety monitor, worn correctly, while working near or on antennas.

5) If possible, power to telecommunications equipment should be turned off for work on or near transmitting antennas.

6) If possible, maintain a minimum 15-foot clearance for all antennas.

3602 Safe Work Practices around Microwave Transmission

A) Areas in which electromagnetic radiation levels exceed PGE's radiation protection guide (not more than six minutes at power level of 10 mW/cm2 for frequencies from 10 MHz to 100 GHz), must be posted with warning symbols. The following language, or its equivalent, is also required to appear in the lower half of the warning sign: *Radiation in this area may exceed*

hazardous limitations and special precautions are required before entering.

B) If you work in an area where electromagnetic radiation could exceed PGE's radiation protection guide, take protective measures to limit your exposure. These may include administrative (e.g., time limitations) and engineering (e.g., installation of barriers) controls and/or PPE. For more information and guidance on safe practices to follow, contact Substation Operations Communications Support for assistance.

C) Open waveguide or antenna precautions:

1) **DO NOT** look into an open waveguide or antenna if connected to an energized microwave source.

2) When performing work on power line carrier equipment and the transmission line is energized, follow safe work practices for working on energized lines, including coupling carrier current to power line conductors. When the transmission line is de-energized, follow safe work practices for grounding of substation equipment.

D) Tower work:

1) All personnel performing work on steel lattice must have applicable rescue training.

2) Oregon OSHA requires 100 percent tie-off when work is performed on all steel lattice towers.

3) When working on towers containing microwave communications systems, post a person on the ground who is qualified to perform tower rescue.

3603 Working around Fiber Optic Cable (FOC)

A) General safety:

1) If you come upon broken or damaged FOC, follow these steps:

a) **DO NOT** look directly into the ends of the fiber strands.

b) Tape up broken or fractured sections with electrical tape.

2) If working on/around FOC, follow these guidelines:

a) Avoid any direct contact with the skin. Broken ends and scraps of fibers can easily penetrate the skin, causing irritation and potential infection.

b) Keep all food and beverages out of the work area. If fibers are ingested, they can cause internal hemorrhaging.

c) Keep track of all fiber and cable scraps and dispose of them properly. If available, work on black work mats and wear disposable lab aprons to minimize fiber particles on your clothing. Fiber particles on your clothing can later get into food, drinks, and/or be ingested by other means.

d) Never look directly into the end of fiber cables, especially with a microscope, until you are positive that there is no light source at the other end, having tested it with a power meter. Use a fiber optic power meter to make certain the fiber is dark. When using an optical tracer

or continuity checker, look at the fiber from an angle at least 6 inches away from your eye to determine if visible light is present.

e) Contact lens wearers must not handle their lenses until they have thoroughly washed their hands.

f) Work in well-ventilated areas.

g) Keep all combustible materials safely away from the curing ovens and fusion splicers.

h) Thoroughly clean your work area when you are done.

B) Working with optical ground wire (OPGW):

1) When working with OPGW, the cable is to be treated as if energized. All grounding practices apply.

3700 Personal Protective Equipment (PPE) (Six for Safety)

A) This section covers rules for protective equipment for eyes, face, head, extremities and torso, including protective clothing, respiratory devices, shields and barriers.

1) Employees are required to wear PPE wherever they may encounter hazardous processes or environments, chemical hazards, radiological hazards, or mechanical irritants that are capable of causing injury or impairing bodily function through absorption, inhalation or physical contact.

CAUTION: If an employee feels that use of PPE creates a greater hazard, stop work and contact your supervisor for support. Work cannot proceed unless the hazard is eliminated or the proper level of PPE is used.

2) Only PPE provided by the company or approved for purchase through the PPE employee reimbursement program is allowed for use.

3701 Selection, Use and Care

A) Assess the worksite to determine if hazards are present, or are likely to be present, which necessitate use of PPE. If so:

1) Select and use appropriate types of PPE to protect from hazards identified in the hazard assessment.

2) Select PPE that fits properly.

3) Visually inspect PPE prior to use.

4) Wear and use PPE in a manner that makes full use of its protective properties and only for the purpose for which it was designed.

B) PPE is to be maintained in a safe, reliable condition.

1) When not in use, carefully stow protective equipment/devices to avoid damage and deterioration.

2) Remove defective protective equipment from service.

3702 Clothing

A) All employees shall dress in a manner suited to their occupation and the hazards of their job.

1) Appropriate high temperature protective clothing must be worn by workers who could be exposed to molten metals or other substances that can cause burns.

2) Loose sleeves, ties, lapels, cuffs, or other loose clothing must not be worn near moving machinery.

3) Clothing saturated or impregnated with flammable liquids, corrosive or toxic substances, irritants, or oxidizing agents must be removed immediately and not worn again until properly cleaned.

4) Never wear rings, wristwatches, earrings, bracelets and other jewelry which might contact power-driven machinery or electric circuitry.

B) Employees working on or near exposed electrical conductors or equipment energized at 50 volts (ac or dc) or greater shall not wear clothing made of, or which contain, synthetic fabrics such as acetate, nylon, polyester, rayon and polypropylene, either alone or in blends that have not been treated for flame-retardancy.

C) Employees shall wear only FR clothing that is approved for use by PGE.

D) FR clothing:

1) Line crews shall wear FR clothing as the outer layer on the job at all times. For other employees, FR clothing shall be worn as the outer layer on jobs where work occurs within 15 feet of exposed conductors or equipment that has potential for electrical flashover. (See *Section 2200 — Electrical Safety – Arc Flash*.) FR clothing shall be worn with the sleeves fully extended and buttoned, shirt buttoned to the top button and tails tucked into the pants to reduce exposure of bare skin and avoid the possibility of the shirt ‘tenting’ in the event of an arc flash.

2) Shall be removed from service when they have holes or tears that cannot be repaired, when fabric has thinned and become "threadbare" or when contaminated with flammable substances if the garment cannot be adequately decontaminated.

E) Wear long-sleeved apparel with sleeves rolled down when there is a hazard of injuring the arms, including but not limited to:

1) When rubber gloves are required.
2) Climbing poles.
3) Working on overhead lines.
4) Working in manholes, vaults or underground installations.
5) Working in electrical panels.
6) Installing meters into energized bases.
7) Working with hot compounds, oils, metals or open flames.
8) Working in or around poisonous vegetation.
9) Working near hot boiler piping.
10) Working with chemicals.
11) Working where there is exposure to cuts/abrasions on forearms.

3703 Eye Protection

A) General rules: Wear suitable eye protection when engaging in any work activity that could put one's eyes at risk. This applies to employees as well as visitors.

1) Safety glasses, safety goggles and face shields are required when in or around areas where potential hazards could cause injury to unprotected eyes/face.

a) When a hazard assessment requires a face shield to be worn, safety glasses or safety goggles are also required under the face shield.

b) Where electrical, mechanical or structural work is in progress, ANSI Z87.1 approved safety glasses with side shields are required. If side shields are not an integral part of frame or are removable but not present, safety over glasses shall be worn. Frames and glasses must be marked accordingly, identifying them as manufactured to the ANSI Z87.1 standard. This also specifically applies to prescriptions safety glasses with removable side shields.

c) When switching and/or grounding indoors or in a confined/enclosed area, approved arc-flash-rated face shields and safety glasses are required.

2) Normally, wearing safety glasses with exposed metal frames is not considered an electrical contact hazard. However, when an employee wearing metal-framed glasses is working with his

or her face extremely close to energized parts, an electrical hazard may be present. In such cases, the employee should switch to either a nonconductive protective face shield or appropriate safety goggles/glasses to place over the metal frame safety glasses.

B) Obtaining safety glasses: Tinted and untinted nonprescription safety glasses can be picked up from store stock. If you require prescription safety glasses, you may be reimbursed by the company in accordance with the Personal Protective Equipment Reimbursement Program.

1) PGE provides prescription safety glasses in special frames to employees who must wear prescription glasses while wearing a full- face respirator. See PGE's Safety website for more information. The employee pays only for the eye exam

2) Contact lenses may be worn, but eye protection must still be used when exposure to dust, fumes, molten metals, chemicals or high temperatures may occur. Contacts may be worn with full-face air-purifying or supplied-air respirators if the employee has:

a) Successfully worn contacts for some time.

b) Practiced wearing a respirator while wearing contacts.

c) Received specific training on what to do if vision problems develop.

3) Face and eye protection equipment shall be kept clean and in good repair. **DO NOT** use equipment with structural or optical defects.

NOTE: All employees entering a substation are required to wear FR clothing, hard hats, safety glasses and boots. Safety glasses and hard hats may not be required, with approval of the person in charge of the work as documented in the pre-job briefing/tailboard form (as applicable), if the work being performed does not pose a risk to the employee's head or eyes. This exclusion is typically for indoor work and includes, but is not limited to, print work, wire identification and using electronic devices such as laptops and tablets.

3704 Head Protection

A) Approved protective hats, caps (Type I, Class E) or other headgear shall be worn by employees and visitors on jobs requiring head protection and in specified areas as required.

1) Hard-hat areas include all locations where construction or maintenance work of any nature is in progress.

2) When required, hard hats will be worn throughout the entire jobsite. Jobsite supervisors or foremen/leadmen shall require all employees and others entering the area to conform to this rule.

3) Equipment operators and drivers within closed compartments are considered outside a jobsite. However, when exiting the closed compartment for

any reason, these employees must conform to the hard-hat rule.

4) Baseball hats or equivalent headgear that does not fully rest on the wearer's head shall not be worn under hard hats. Brimless, soft top fabric caps designed for use with hard hats may be worn under hard hats.

B) Wear it correctly. **DO NOT** alter or wear head protection equipment in a way that reduces its electrical or impact qualities. For example, wear hard hats with peaks facing forward unless wearing a rear-mounted mask or face shield.

C) **DO NOT**:

1) Remove helmet/hard hat's visor.

2) Store or carry helmet/hard hat on rear window shelf of vehicle.

3) Make any holes in helmet/hard hat.

4) Adorn helmet/hard hat with decals, paint, tape or printing unless approved by PGE.

D) **DO**:

1) Keep hard hat clean so damage or defects can be seen.

2) Inspect hard hat each day prior to use.

3) Immediately replace hard hat if damaged due to impact or if ultraviolet light degraded the integrity of the hard hat.

4) Annually replace the suspension system of the hard hat.

5) Consider replacing hard hat every five years from the date indicated on the helmet as suggested by the manufacturer.

6) At least annually, conduct a simple field compression test to identify possible degradation of polyethylene shells. This can be performed by an employee or supervisor. If the hard hat fails this test, it must be replaced.

    a) ***Hard hat field compression test:*** Compress the shell inward from the sides about 1 inch (2.5 cm) with both hands, and then release the pressure without dropping the shell. The shell should quickly return to its original shape, exhibiting elasticity. If it does not exhibit elasticity or cracks due to brittleness, it must be replaced immediately.

3705 Hearing Protection

A) Damage to hearing can be prevented, but once permanent noise-induced hearing loss occurs, it cannot be cured or reversed.

B) Sound intensity is measured in decibels. A small increase in decibels results in a huge change in the amount of noise and potential damage to a person's hearing. If noise levels increase by 3 decibels (on the A-weighted scale – dBA), this doubles the amount of noise and reduces the recommended amount of exposure time by half.

C) Wear hearing protection.

1) Hearing protection is required when working around noise exceeding 85 dBA.

2) Make sure hearing protectors seal properly. Insert earplugs to correct depth in ear canal.

3) Contact your safety coordinator if different hearing protectors are needed than what is available.

4) Know when work noise exceeds 85 dBA. Generally, if you have to shout to be heard by someone 3 feet away, noise exceeds 85 dBA. Noise levels vary for tools, equipment and work environments. The following are examples of equipment exceeding 85 dBA:

   a) Chainsaws

   b) Air-powered tools

   c) Concrete saws

   d) Closing cutouts into a fault

   e) Tripping high-voltage circuit breakers

   f) Jackhammers

   g) Vacuum trucks

   h) Underdawgs

5) The following are examples of equipment that can, under certain circumstances, exceed 85 dBA:

   a) Trenchers

   b) Tractors

   c) Hole diggers

d) Emergency generators

e) Tensioners

f) Compactors

g) Truck fans and motors

h) Oil processing units

i) Ground rod drivers

j) Construction sites

k) Customers' sites

D) Request noise level testing of specific equipment and work areas from your safety coordinator.

3706 Foot Protection

A) Employees shall wear protective footwear when working in areas where falling or rolling objects could injure feet, or objects could pierce soles. (A hazard assessment for PPE may waive this requirement for some work groups.)

1) Wear safety shoes conforming to ASTM F2413 standards whenever a hazard assessment indicates they are required.

2) Evaluate the need for ankle support and proper traction for work being performed.

B) All work boots or shoes must have at least a 5/8-inch heel depth.

C) Employees may be reimbursed for safety boots and shoes, in accordance with the Personal Protective Equipment Reimbursement Program.

3707 Respiratory Protection

A) Respiratory protection is to be worn wherever air contaminant levels do not meet occupational health regulations and cannot be controlled by ventilation or other means.

B) To wear a reusable respirator, an employee must:

   1) Be medically qualified; i.e., complete a medical questionnaire and pass a respirator physical exam.

   2) Be trained in the use, care and fitting of a respirator before being issued one.

   3) Be quantitatively fit-tested to obtain an optimal facepiece-to-face seal, if using a respirator with tight-fitting face pieces.

C) Selection of respiratory equipment shall be based on the anticipated or measured inhalation hazard. The following table describes different types of inhalation hazards that could be encountered in the field and appropriate minimum respiratory protective equipment.

D) Respiratory protection shall be inspected before and after use and kept in clean, sanitary condition. Emergency use respirators shall be thoroughly inspected monthly.

E) For more information on use of respiratory protection, consult the written Respiratory Protection Program developed for your operations, your safety coordinator or PGE Safety & Resiliency – Industrial Hygiene.

Table 3707-1. Respirator Types for Specific Hazards

Hazard	Respirator Type
Asbestos	Full or half mask with a P100 filter
Welding fumes, grinding dust	• Disposable mask/full or half mask with a P100 filter • Powered air-purifying respirator
Lead, dust/fumes, chromate dusts	Full or half mask with a P100 filter
Solvent vapors, protective coatings and adhesives, if in an area without good natural ventilation	Full or half mask with organic vapor cartridges
Paint spraying with epoxy or two-component systems	Air-supplied respirator with full face or hood
PCBs (heated)	Air-supplied respirator or self-contained breathing apparatus
PCBs (contaminated dust or mist)	Full or half mask with a P100 filter providing organic vapor protection
Abrasive blasting (i.e., sandblasting)	Air-supplied respirator providing full head and face protection
Fires, oxygen deficiencies, unknown inhalation hazards	Self-contained breathing apparatus

3708 PPE Requirements for Storeroom and Transformer Shop Operations

Table 3708-1. PPE Requirements for Storeroom and Transformer Shop Operations

PPE	Conditions or Activity
Protective eyewear	Protective eyewear is required when handling material inside or outside the storerooms and when operating equipment.
Hard hat	A hard hat is required whenever electrical, mechanical or structural work is in progress and/or the potential for head injuries exists.

Table 3708-1. PPE Requirements for Storeroom and Transformer Shop Operations

PPE	Conditions or Activity
Long-sleeved clothing	When general hazards (which may include cleaning off trucks, working with recycling, interacting with the crews) exists, long-sleeved clothing is required.
High-visibility clothing/vest	High-visibility clothing/vest shall be worn at all times when working in the storeroom or in the yard. High-visibility shirts must be long-sleeved and must meet the ANSI 107-2010 Class 3 high-visibility reflective standard.
Safety-toe shoes	ASTM-approved safety-toe shoes are required when working in the storeroom or in the yard.
Seat belts	Seat belts must be worn when operating a forklift or when driving or riding in a vehicle on company business. Follow PGE policies and guidelines.
Protective gloves (appropriate for the task)	Protective gloves must be worn when handling, using or disposing of toxic, flammable or reactive chemicals and when handling materials with rough surfaces and/or when a potential for penetration exists.
Hearing protection	Hearing protection must be worn whenever noise levels and duration exceed limits of OSHA regulations or whenever an employee deems it necessary.
Follow appropriate PPE requirements as dictated by the situation	When working or in the immediate vicinity of work being performed, follow the appropriate PPE requirements as dictated by the situation. Be familiar with all precautionary measures to handle materials safely per MSDS and manufacturers' specifications.
Field deliveries	Storeroom personnel shall not enter any substations or arc zones. PPE for all deliveries when entering work zones shall be: • Long-sleeved top • Long pants • High-visibility vest/clothing • Hard hat • Safety glasses

3709 Working Gloves

A) Employees are required to use appropriate hand protection when hands may be exposed to hazards. These include potential skin absorption of harmful substances; severe cuts, lacerations, abrasions, or punctures; and chemical burns, thermal burns or harmful temperature extremes.

B) Select appropriate hand protection based on its performance characteristics relative to task(s) to be performed, conditions present, duration of use and hazards and potential hazards identified.

1) **DO NOT** wear gloves if your hands are exposed to moving parts.
2) **DO NOT** wear gripper gloves when working in areas where an arc flash could occur. Gripper gloves **DO NOT** meet FR requirements.
3) Leather, cut-resistant and gripper gloves, are available through storerooms.
4) **DO NOT** wear leather protectors as work gloves.
5) Insulated rubber gloves are also available through storerooms for employees trained and qualified to work on or near electrical equipment.

3710 Rubber Protective Equipment

A) Frequency of testing and exchanging rubber protective equipment:

1) Rubber protective equipment is tested by an approved test laboratory and has the test date stamped on the equipment.

2) Employees shall exchange rubber gloves at or near three months after the test date.

3) Employees shall exchange rubber blankets, line hose, hoods and similar rubber protective equipment at or near six months after the test date.

4) Inspect all rubber protective equipment before each use or following any incident that could cause damage. Look for:

a) Corona damage.

b) Embedded foreign matter.

c) Scratches, cracked rubber, snags, blisters or other mechanical defects.

5) Any rubber protective equipment found to be defective during inspection or use shall be removed from service, tagged as “defective” and sent to the tool/storeroom for testing by the approved test laboratory.

B) Care of rubber blankets, line hose, hoods and similar rubber protective equipment:

1) All rubber blankets, line hose, hoods and similar rubber protective equipment shall be stored in

such a manner as to be free from damage or cuts. Blankets shall be rolled and stored in approved containers provided for that purpose. They shall also be wiped clean and dry before storing.

2) Rubber protective equipment should not be left on conductors for periods of time that can cause excessive corona reaction. They should be removed and reinstalled later if necessary.

C) Care of rubber gloves:

1) Store in glove bags with cuffs down. **DO NOT** store or wear inside out.

2) Rubber gloves shall at all times be worn with approved cover gloves provided for that purpose.

a) Low-voltage gloves may be worn without protectors if additional dexterity is needed.

b) Insulating gloves that have been used without protector gloves shall not be reused until they have been tested.

3) Inspect rubber gloves before each use or following any incident that:

a) Could cause damage. Use air-test method to check for holes.

b) If holes are found, red tag gloves and return to storeroom to be sent back to test facility for analysis.

D) Using rubber gloves:

1) Employees shall wear rubber insulating gloves any time they work on or approach energized

conductors or equipment, or take any conductive object closer to exposed energized parts than established minimum approach distances. This applies to alternating current (AC) and direct current (DC) voltages at 50 volts or greater.

a) Use Class 00 gloves on voltages of 50 up to 500 volts.

b) Use Class 0 gloves on voltages of 50 up to 600 volts.

c) Use Class 2 gloves on voltages of 50 up to 600 volts.

2) Always wear leather protectors over rubber gloves when:

a) You are in a position that could bring you into contact with a wire.

b) On poles or structures carrying a wire.

3) **DO NOT** use leather protectors as work gloves.

4) Wear Class 2 gloves when:

a) Opening energized pad-mounted transformers, transclosures and switchgear without a visible ground.

b) Working 2 feet 2 inches or closer to parts or conductors energized over 600 V.

c) Setting poles near energized conductors.

d) On any job when a supervisor or person responsible determines Class 2 gloves are appropriate protection.

5) Wear Class 4 gloves when:

   a) Opening energized collectors or equipment associated with 34.5 kV systems without a visible ground.

   b) Working within 2 feet 4 inches or closer to conductors energized at 34.5 kV.

   c) On any job when a supervisor or person responsible determines Class 3 gloves are appropriate protection.

6) High-voltage vicinity:

   a) Workers shall wear rubber gloves before reaching a position where they can reach into the minimum approach distance (MAD) of exposed energized conductors or equipment.

   b) **DO NOT** remove rubber gloves until entirely clear of the MAD.

3711 Working Near Mass Transit/Trains

A) While working near light rail, wear green/yellow FR, ANSI 107 vests.

B) While working near heavy rail, wear orange FR, ANSI 107 vests.

NOTE: Working within right-of-way (ROW) (within 25 feet of the railway) may require track access permits and qualified rail flaggers.

3712 Flotation Devices

A) See *Section 4400 — Working Around Water*.

B) Employees working over or near water, where danger of drowning exists, shall be provided with U.S. Coast Guard-approved life jackets or buoyant work vests.

C) Prior to and after each use, buoyant work vests or life preservers shall be inspected for defects that could alter strength or buoyancy. **DO NOT** use defective units.

D) At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water.

E) Workers on piers, docks, wharves and work sites along developed shorelines must have rescue devices available within 200 feet of water or shoreline work areas.

   1) A rescue device is defined as a ring buoy and line, gaff pole, throwable rescue device or other device that serves as means to rescue somebody from water without requiring the rescuer to enter water.

F) Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

3800 Tools/Equipment Safety – Equipment

3801 Machine Guarding

A) Machine guards are tangible materials used to keep you from having direct contact with a machine's moving parts. In addition, some guards can help protect you from kickbacks, flying chips and splashing liquids.

B) The following are some examples of equipment or machines that require or are manufactured with guards:

1) Chains, gears, pulleys, cranks, sprockets, and connecting rods
2) Rope drives, belt drives and chain drives
3) Projecting shaft ends
4) Transmission shafts
5) Flywheels
6) Belt tighteners
7) Portable saws
8) Portable belt sanders
9) Portable grinders
10) Pneumatic tools
11) Powder-actuated tools
12) Openings for frequent oiling

C) Important things to remember when using machines or equipment with guards:

1) Guards must always be secured to the machine or equipment.

2) Guards must never be positioned or fastened to moving parts in a way that creates a pinch point.

3) Fasteners used to secure guards to a machine must require the use of tools for their removal.

4) For large equipment:

a) All guards must be rigidly braced every 3 feet or less to a fixed part of a structure or machine.

b) Guardrails must be at least 42 in. high with a clearance of at least 15 in., but not more than 20 in. from the machine.

c) Toe boards must be at least 4 in. in height.

D) Identifying hazards is the first step toward protecting workers from mechanical hazards. The basic types of hazards are:

1) Mechanical Motions:

a) Rotating (including in-running nip points)

b) Reciprocation

c) Transversing

2) Mechanical Actions:

a) Cutting

b) Punching

c) Shearing

d) Bending

E) Safeguards can be grouped under five general classifications.

1) Guards:

a) ***Fixed guards*** are permanent parts of a machine. These guards are preferable because they're simple and permanent.

b) ***Interlocked guards*** automatically shut off or disengage a machine through a tripping mechanism or power when the guard is opened or removed. The machine cannot cycle or start until the guard is replaced.

c) ***Adjustable guards*** are useful because they accommodate various sizes of material.

d) ***Self-adjusting guards*** allow the opening of the barrier to be determined by the stock. As the operator moves the stock into the danger area, the guard is pushed away, providing an opening that only is large enough for the material.

2) Devices:

a) ***Presence-sensing devices*** are divided into two groups: Photoelectrical devices use light sources and controls that can interrupt the machine. Radiofrequency or capacitance devices use a radio beam that is part of the machine circuit. When the capacitance field is broken, the machine will stop.

b) ***Electromechanical-sensing devices*** have a probe or contact bar that moves to a predetermined distance when the operator initiates the machine cycle. If there is an obstruction preventing it from moving to its full, predetermined distance, the control circuit does not start the machine.

c) ***Pullback devices*** use cables attached to the operator's hands, wrists and/or arms. They primarily are used on machines with striking-action hazards. When the slide/ram is up, the operator is allowed access to the points of operation. When the slide/ram descends, a mechanical link automatically assures that the operator's hands move away from the points of operation.

d) ***Restraint devices*** allow the operator's hands to travel only in a predetermined safe area.

3) Safety Controls:

a) Safety trip controls, such as pressure-sensitive body bars, safety tripods and safety tripwire cables, can quickly deactivate a machine operation.

b) Two-hand controls take both hands and constant pressure on the controls for the machine to operate.

4) Gates:

   a) Gates are movable barriers that protect the operator at the point of operation before the machine cycle starts.

5) Location/Distance:

   a) Though not actual guards, location and distance can keep employees safe. You can place a machine in an infrequently traveled area or where its dangerous moving parts are not accessible. A thorough hazard analysis of each machine and particular situation is essential before using this safeguarding technique.

F) Guard Construction:

1) Guards designed and installed by the machine producer are desirable because they conform to the design and function of the machine, and they can be designed to strengthen the machine or to serve some additional functional purpose.

2) User-built guards are sometimes necessary and have some advantages. Often, with older machines, they are the only practical solution. They also might be the only choice for mechanical power transmission apparatuses in older plants. User-built guards shall be engineered and built to meet unique and changing situations.

G) Guard Materials:

1) Metal, plastic and wood all are used as construction materials for machine guards. In

many circumstances, metal is the best material for guards. It might also be feasible to use plastic where higher machine visibility is required. Guards made of wood are generally not recommended because of their flammability and lack of durability and strength.

3802 Portable Fuel-Powered Equipment

A) General guidelines:

1) Proper PPE shall be worn when using equipment.
2) **DO NOT** fill fuel tanks while the motor is running.
    a) Let the engine cool before filling the gas tank.
    b) Never smoke while the gas tank is being filled.
3) **DO NOT** use equipment showing evidence of gasoline leaks until repaired.
4) Fuel shall be handled, transported and stored only in approved containers or locations. Maintain metal-to-metal contact while pouring gasoline from one container to another.
5) **DO NOT** use fuel-powered tools in enclosed or confined spaces without adequate ventilation.
6) **DO NOT** operate a portable generator near a building's air intake vent.
7) Only trained, authorized employees shall repair gasoline-powered equipment.

B) Portable and vehicle-mounted generators supplying power to cord and plug-connected equipment shall do

so through receptacles mounted on the vehicle or generator.

1) Generator receptacles must be bonded to the generator frame.
2) For vehicle-mounted generators, the frame of the generator must be bonded to the vehicle's frame.
3) All neutral conductors shall be bonded to the generator frame.

C) Power lawn mowers, power trimmers and chainsaws:

1) Read and follow all safety instructions in the equipment's owner's manual.
2) All power equipment must be equipped with adequate guards; check that all applicable guards are in place and **DO NOT** use the equipment if missing.
3) Wear appropriate PPE at all times, such as a hard hat, safety glasses with side shields, hearing protection and proper safety work boots or shoes.
4) Be aware that you could be exposed to poisonous plants (e.g., poison oak) and insects, reptiles or other animals that could cause injury.
5) Prior to making adjustments, inspections or repairs, turn off the equipment and allow it to come to a complete stop.

NOTE: When working under a mower deck, disconnect the spark plug wire and remove the ignition key, if so equipped.

6) Operating power mowers:

   a) Inspect the area and remove any foreign objects that may be struck by the mower.

   b) Avoid placing your body in front of the discharge opening and **DO NOT** allow the mower to discharge in a direction hazardous to others.

   c) Keep your hands and feet clear of the blade. Never reach under the deck of an operating mower to clear or remove debris. First shut down the equipment and turn off the engine.

   d) Mow horizontally across the face of a slope when using a push mower. Mow up and down (vertically) the face of a slope when mowing a slope with a riding mower/tractor. Always follow manufacturer's guidelines while mowing slopes.

   e) **DO NOT** leave running mowers unattended.

7) Operating a power trimmer:

   a) Wear appropriate PPE, including hard hat, safety glasses with side shields, face shield, hearing protection, gloves and appropriate foot protection.

8) Operating chainsaws:

   a) Only trained operators shall operate chainsaws.

   b) Wear appropriate PPE, including hard hat, safety glasses with side shields, hearing

protection, gloves and appropriate foot protection, as well as protective chaps or other protection sewn/fastened to trousers, protecting legs from the thigh to below the knee. Exception: Chaps **DO NOT** need to be worn when saw is to be operated outside of a bucket on aerial man-lift equipment or from a pole.

c) Start and test-operate the chainsaw engine on the ground.

   i) When starting a saw, be sure footing is secure.

   ii) Start the saw at least 10 feet away from fuel sources, flames, sparks or ignition sources.

   iii) At no time is “drop starting” a chainsaw allowed.

d) Keep both hands firmly on the saw when in use, one on the handle bar, the other on the pistol grip.

e) Avoid using a chainsaw above shoulder level. Never cut directly overhead.

f) **DO NOT** remove or disable chainsaw kickback devices.

g) Each chainsaw must return to idle automatically and the clutch must not engage the chain at idle. If the saw is malfunctioning, stop at once.

h) Always approach a chainsaw operator from the front.

i) When working aloft or in trees:

   i) Never raise or lower a chainsaw from/to the ground with the engine running.

   ii) Use a separate line to support chainsaws weighing more than 15 pounds except when no supporting limb is available, such as during topping or removal operations.

   iii) When working from a power pole, use a wire rope skid in combination with wood pole fall protection.

   iv) Maintain proper clearances from energized lines at all times.

j) **DO NOT** leave idling saws unattended. When carrying a saw beyond a few steps, turn the engine off and carry it with the blade to the rear.

k) Make sure the chain guard is attached when the saw is not in use.

l) Turn off power and allow cooling before cleaning, refueling, adjusting or repairing a saw or motor, unless manufacturer's procedures require otherwise. (Some minor adjustments can only be made when the engine is running.)

m) Chainsaws shall be regularly inspected to ensure they are clean, sharp and properly tensioned.

n) Use an approved safety container with flame arrestor to store fuel for chainsaws.

o) After refueling, wipe down the saw before starting and make sure the cap is in good repair and properly replaced.

3803 Grinders and Buffing Wheels

A) General safety rules:

1) Never use grinders or buffing wheels if the protective guards have been removed or made inoperative.

2) Fixed location grinders shall be securely anchored to prevent movement during normal operation.

3) When using this equipment, wear appropriate PPE, including hearing and eye protection and face shields, in addition to using the built-in eye protection mounted on grinders or buffing wheels.

4) **DO NOT** wear gloves when operating rotating machinery that could pull your hand into the equipment.

5) Inspect bench, stand or portable grinders and buffing wheels before use to ensure they are in safe operating condition.

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

a) The wheel shall be inspected visually, ring-tested and its condition determined. If the wheel is found defective, it shall be discarded.

b) Only trained and authorized personnel shall adjust or repair grinders and buffing wheels.

B) Mounting grinding wheels:

1) Qualified persons shall be assigned to the mounting, care and inspection of grinding wheels and machinery.

2) Disconnect the source of power before working on grinders.

3) Select the correct wheel for the operation. "Ring test" it and inspect visually for cracks. Never use a cracked or damaged wheel.

4) Never alter the hole in the wheel or force the wheel on the spindle.

5) Use clean, recessed, matching flanges at least one-third of the wheel's diameter.

6) Use one clean, smooth blatter (compressible washer) on each side of the wheel under each flange.

7) Tighten the nut only enough to hold the wheel firmly in place.

8) After mounting a wheel, properly position safety guards and put on PPE before starting the wheel.

a) Stand clear of the area when starting the wheel in case the wheel assembly comes apart.

b) Only qualified personnel may balance unbalanced wheels. Wheels that cannot be balanced by truing or dressing shall be removed from the machine.

C) Operating a grinding wheel:

1) Grinding-wheel operators shall be fully instructed in the use, care and protection of grinding wheels.

2) Work rests must be kept adjusted to within one-eighth inch from the wheel. Distance between the tongue guard (top) and the wheel must be kept to less than one-eighth inch from the grinding wheel.

3) Never exceed the maximum safe speed established for the wheel. Be certain the wheel in use is rated for the grinder's speed.

4) Only use cut-off wheels with burr grinders if they are designed for that purpose. **DO NOT** adapt a burr grinder to accept a cut-off wheel.

5) When beginning a grinding task, stand aside and allow the wheel to run idle for a full minute before starting to grind.

6) Make grinding contact without "bumping" or hard impact. Never force grinding so that the motor slows noticeably or the work gets hot.

7) Grind only on the face of a straight wheel. Disc wheels can be used for side-grinding. Light side-grinding is permissible on cup or saucer wheels.

8) Operators of portable grinders shall grip the tool with both hands, except where work configuration does not allow the use of both hands or when designed for single hand use.

9) **DO NOT** apply soft material (e.g., brass, copper, aluminum, soapstone, wood, etc.) to a grinding wheel.

10) Protect the wheel when it is not in use. Properly store grinding wheels in safe, dry locations.

D) Using wire brush wheels:

1) Hold the work item at the horizontal center of the brush.

2) **DO NOT** force the work item into the brush, as this does not increase cutting action but does increase wire breakage and may cause the item to become snagged.

3) Hold small pieces being brushed in a simple jig or fixture to prevent your hand from contacting the brush.

4) Use a work rest when cleaning with small brushes.

5) Use a straight, heavy steel rod or bar to clean the wire wheel; never use a small ring.

3804 Portable Heating Equipment (Kerosene, LPG, Electric)

A) Use any fossil fuel-burning portable heating equipment in a well-ventilated area.

B) Kerosene: When filling the fuel tanks of kerosene equipment, ensure the flame is completely extinguished and ensure the fuel being added is kerosene.

C) LPG: Make sure all fittings are tight and do not leak before lighting the equipment.

D) Electric: Check electrical cords for wear to ensure they are in safe condition. Ensure you are plugging equipment into the proper voltage source.

E) Never leave operating portable heaters unattended.

3805 Operating Vehicles with Hydraulic Equipment

A) When moving such a vehicle:

1) Before extending or retracting outriggers or hydraulic jacks, make sure the path is clear.
2) Properly stow the boom or derrick in its support.
3) Completely retract all outriggers to stowed position.
4) Stow and lock digger in its carrier on the side of the boom.
5) Tie down the boom with straps, where provided.
6) Know where the hydraulic shut-off is located.

B) Know the vehicle's height. There will be a label inside the cab on the driver's side indicating the vehicle height with the boom stowed in travel position.

C) Parking at jobsites:

1) Park in the most stable position possible. Avoid uneven and soft terrain.
2) Set brake securely.
3) Always use wheel chocks. Outriggers **DO NOT** take the place of wheel chocks.
4) Place pads under the outriggers, as needed.

D) If hydraulic equipment develops a leak and poses an environmental or safety hazard:

1) Stop work.

2) Disengage the hydraulic pump.

3) Confine the spill and clean up if safe to do so. Contact the oil spill crew as needed.

4) Have repairs made by a qualified mechanic.

E) Never use your hands, feet or body to:

1) Stop or locate oil leaks.

2) Deflect flow of oil from oil leaks.

3) Stop or locate leaks in the air system. (See *Section 3808 — Hydraulic Injection Prevention and Treatment.*)

3806 Aerial Man-Lifts

A) Training:

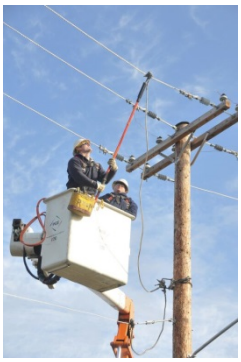
1) Only trained and authorized employees are allowed to operate an aerial lift. Training should include:

a) Explanations of electrical, fall and falling object hazards.

b) Procedures for handling hazards.

c) Recognizing and avoiding unsafe conditions in the work setting.

d) Instructions for correct operation of the lift (including maximum intended load and load capacity).



e) Demonstrations of the skills and knowledge needed to operate an aerial lift before operating it on the job.

f) When and how to perform inspections.

g) Manufacturer's requirements.

B) Operator requirements:

1) Body harnesses and lanyards are required when working from aerial equipment. Attach fall-arrest systems to prevent free-fall more than 6 feet or striking a lower level.

2) Attach the lanyards to an approved attachment point on the aerial man-lift upon entering and before operating the boom. The shock-absorbing end of the lanyard must be attached to the harness.

3) Use of snap hooks is required. Snap hooks will not be connected to each other.

C) Using aerial man-lift equipment:

1) General rules:

a) Inspect and fly the boom and bucket daily at beginning of each work shift.

b) **DO NOT** operate any aerial lift with defective components until it is repaired by a qualified person. Red tag and remove defective aerial lifts from service until necessary repairs are made.

c) **DO NOT** move the vehicle while the boom is elevated unless allowed by the manufacturer.

d) **DO NOT** operate an aerial lift in high winds (above speeds recommended by the manufacturer).

e) Always stand firmly on the floor of the bucket/basket. Never sit or climb on the edge or use planks, ladders or other devices for a work position.

f) **DO NOT** wear climbers while in the bucket/basket.

g) **DO NOT** belt-off to adjacent structures or poles while in the bucket.

h) Ensure that access gates or openings are closed and locked in position.

i) **DO NOT** operate ground-level controls while an employee is working from an aerial basket unless requested by that employee or it is an emergency.

2) **DO NOT** bypass insulation systems on aerial equipment. Specifically:

a) **DO NOT** use electric drills, electric soldering irons or similar corded tools. Use only approved, insulated tools on energized conductors and equipment.

b) Use only hydraulic tools with approved insulated hoses that operate from truck tool systems or other approved hydraulic power sources.

c) Cover energized equipment and conductors with protective devices and **DO NOT** allow the

aerial bucket, basket or boom to make contact with the protective devices.

d) For aerial equipment without lower boom insulators:

i) Ground the vehicle with grounding cable supplied with vehicle to the system neutral if possible

ii) Properly isolate and barricade vehicle

3) **DO NOT** exceed load capacity limits. Take the combined weight of the worker(s), tools and materials into account when calculating the load. A label showing this capacity must be prominently displayed.

4) Hydraulic fluids used for insulated sections must provide insulation for the voltage involved.

5) Testing procedures:

a) Inspect, maintain and test aerial basket equipment according to information supplied for each unit. Conduct electrical tests on the boom and all other insulated components as required.

b) Retest after completing work that could affect dielectric integrity of the boom, bucket, basket or control assembly before returning to service.

c) Designate any aerial bucket or basket equipment without a current dielectric testing sticker as non-insulating.

D) Outriggers:

1) Keep extended and firmly set for stability.

2) Operators: **DO NOT** extend or retract outriggers if you can't see them. Always verbally warn other workers before lowering or raising them.

3) If the work area or terrain prevents using outriggers, operate equipment only within the manufacturer's maximum load ratings for the condition.

3807 Industrial Trucks/Forklifts

A) General safety:

1) Only trained and authorized operators may operate powered industrial trucks (forklifts).

   a) Forklift operators must be recertified every three years.

2) Never stand or pass beneath the elevated portion of lifts or the suspended load.

3) Only the operator is allowed to ride on forklifts.

4) Wear seat belts at all times when operating forklifts.

B) Loading/unloading:

1) Only handle loads within the rated capacity of the forklift. Keep all nameplates (with rated capacity) legible/readable.

2) The brakes of highway trucks should be set and wheel chocks placed under the rear wheels (if practical) to prevent the truck from rolling while being loaded or unloaded with powered industrial trucks.

3) Loads should be handled by two people, when applicable.

C) Operation:

1) Follow a preuse Safety Inspection Sheet to inspect the operating safety of a forklift prior to use at least once per shift. Document the results and retain inspection books for three months prior to disposal. Immediately report defects to a supervisor. **DO NOT** use a forklift until it is determined safe.

2) Never allow anyone to be lifted by or on forks at any time.

3) **DO NOT** place any part of your body outside the running lines of a forklift or between mast uprights or other parts of the forklift where shear or crushing hazards exist.

4) Maintain sufficient clearance when operating a forklift under overhead installations, lights, pipes and sprinkler systems.

5) Use overhead guards to protect yourself from falling objects.

6) **DO NOT** use forks to push or tow trailers.

7) Properly secure all dockboards or bridge plates before driving over them. **DO NOT** exceed rated capacity.

D) Leaving powered forklifts unattended:

1) Fully lower forks to the ground.

2) Put controls in neutral position.

3) Set brakes.

4) Shut off power.

5) Chock wheels if the forklift is parked on an incline.

3808 Hydraulic Injection Prevention and Treatment

A) The consequences of high-pressure hydraulic injection injuries are potentially severe. Consider the following before you search for a leak in a hose or fitting:

1) Hydraulic and diesel fuel systems can operate at pressures of 3,000 psi and above. A loose connection or defect in a hose can cause a fine, high-velocity stream of fluid that can penetrate human skin.

2) An accidental fluid injection may only produce a slight stinging sensation. Within a very short time the wound may begin to throb painfully, indicating tissue damage has already begun.

3) A fluid injection injury can become very serious or even fatal if not addressed promptly and properly.

This type of injury requires a medical doctor familiar with proper diagnosis and treatment.

B) To avoid high-pressure hydraulic injection injuries:

1) Never grab any hydraulic or diesel fuel connectors or hoses when they are subject to high pressures.

2) Stop the engine and safely relieve all diesel fuel and hydraulic pressures before disconnecting any lines or otherwise working on these pressurized systems.

3) Always ensure hoses are rated for pressures to which they will be subjected. Never use any hoses you suspect could be defective.

4) Never search for leaks with your hands or any other body part; keep all body parts well away from the area of the suspected leak. Keep in mind:

a) The source of the leak and the fluid streaming from it may be very small and not easily visible.

b) You may only be able to see the fluid that accumulates as a result of the fluid stream.

c) The source of the leak and the fluid streaming from it may be hidden behind other components of the equipment. If those components are moved, the direction of the fluid stream could be aimed at you.

5) Recognize that your clothing — even heavy gloves — may offer little to no protection from a high-pressure fluid injection.

6) Be sure to wear safety glasses or goggles for eye protection when working around hydraulic equipment.

7) Only use the far end of a long object such as a piece of wood or steel to move hoses or other obstacles. Similarly, only place the far end of a long object such as a piece of cardboard, wood or steel in the suspected path of any fluid stream.

8) Follow lockout/tag-out procedures – deactivate equipment to a zero energy state.

C) Injection injury emergency response procedures:

1) In case of hydraulic injection, seek immediate medical attention by activating EMS. Prompt medical treatment is essential. Notify PGE nurses of this type of injury immediately.

2) Inform the attending physician immediately of these four critical pieces of information:

a) Fluid type - bring Safety Data Sheets (SDSs), if possible.

b) Amount of fluid injected, if known.

c) Pressure of the fluid injected, if known.

d) Time of injury.

3) The patient should not be discharged until a follow-up plan is discussed and clearly understood by both the patient and his or her supervisor.

3900 Tools/Equipment Safety – Hand Tools

A) General guidelines:

1) Inspect hand and power tools daily before use.
2) Use tools suited to the job. **DO NOT** use makeshift tools.
3) To prevent the hazard of falling tools, **DO NOT** leave tools on ladders or elevated places.
4) Remove defective or broken tools from service. Keep tagged until repaired or discarded.

B) Insulated hand tools:

1) Ensure insulated hand tools used for 1,000 volts and below have an ANSI-approved 1,000 V insulated symbol.
2) Visually inspect insulated hand tools prior to use.
3) **DO NOT** modify insulated hand tools.
4) Generally, insulated hand tools **DO NOT** replace rubber gloves. They are designed only for back-up protection and shall not be used in lieu of normal electrical shock protection, with the following exception: insulated hand tools with a manufacturer's ANSI-approved rating of 1,000 V or more can be used without rubber gloves as long as there is no possibility of inadvertent contact with exposed energized parts.

C) Measuring tapes and rulers:

1) Use only PGE-approved non-metallic measuring tapes and rulers near energized equipment.

D) Chisels and bars:

1) Use a holding tool or other suitable holding device if holding a chisel or bar while another employee strikes it with a hammer.

E) Axes, picks and sledgehammers:

1) **DO NOT** use tools with cracked handles. Replace the handle or discard the tool. **DO NOT** tape handles.

2) Carry an axe with head forward by holding the handle next to the axe head. **DO NOT** carry any axe or brush hook over your shoulder.

3) On vehicles, store axes and picks with protective sheaths to avoid injuries to passengers.

4) Ensure ample space is available to swing axes, picks or sledgehammers.

F) Skinning knives should be stored appropriately when not in use.

G) Pike poles and draw bars:

1) Keep pike poles free from splinters.

2) Keep spear points sharp and securely attached to poles.

3) Stow properly on vehicles and in storerooms to avoid injuries.

4) Inspect drawbars for bent or worn eyes, broken welds and worn or missing safety chains. They should always be equipped with snap hooks.

4000 Tools/Equipment Safety – Power Tools

A) Operate all power tools only within their capability and in accordance with the manufacturer's instructions.

B) Never hold work in your hand when using power tools. Loose work should be clamped to a solid surface to prevent it from moving or being thrown.

4001 Electric-Powered Tools

A) All electric power tools shall be grounded, unless:

1) The tool is cordless or an approved double-insulated type.

2) The tool is connected to the power supply by means of an isolated transformer or other insulated power supply such as a 24-volt, direct-current system.

B) Inspect all power tools prior to use for general serviceability and the presence of all applicable safety features.

1) Check the power cord for wear.

2) Check ground wires for continuity.

3) Ensure that the grounding prong is in good shape; **DO NOT** use electrical tools without a grounding prong.

C) Always unplug a tool before repairing or making adjustments.

D) Keep work spaces and walkways clear of electrical cords to avoid a tripping hazard. Cords passing

through work areas or walkways shall be covered or elevated. (See *Section 4002 — Extension Cords*.)

E) If you observe sparking or smoking in electric motors or other electrical equipment, turn off the power and report the condition at once.

F) Where flammable or explosive atmospheres (gases, vapors and dusts) may exist, use only explosion-proof electrical equipment that is approved for such hazardous locations. Hazardous atmospheres require intrinsically safe tools and equipment.

G) Portable electric lighting and tools used in damp or wet locations shall be operated at 50 volts or less. However, 120-volt equipment may be used if protected by a ground-fault circuit interrupter (GFCI).

H) When used in position, electric tools with magnetic bases must have a safety line attached to them to prevent falling due to a power interruption or other failure of the magnetic base.

4002 Extension Cords

A) Examine extension cords frequently for worn insulation and exposed strands of wire before use. Replace worn or frayed cords and broken plugs promptly.

B) Ensure that the grounding prong is in good shape; and **DO NOT** use an extension cord without a grounding prong.

C) Use only types S, ST and SO extension cords that are designed for hard or extra hard usage.

D) General safety tips:

1) **DO NOT** use an extension cord as a substitute for permanent wiring.

2) **DO NOT** hang extension cords across sharp objects.

3) **DO NOT** run extension cords across aisles where they can be damaged or cause someone to trip. Never daisy-chain.

4) **DO NOT** use extension cords to lower or lift tools.

4003 Pneumatic (Air-Powered) Tools

A) Pneumatic tools shall be operated only by employees who are qualified in their use.

B) Always wear approved PPE when using pneumatic tools.

C) Never point a pneumatic tool toward another person.

D) Make sure an air hose:

1) Does not present a tripping hazard.

2) Is protected from vehicles, pedestrians and sharp objects.

E) Air tool triggers:

1) Must be protected to minimize the danger of accidental operation.

2) Should not be squeezed until the tool is in contact with the work.

F) **NEVER USE** compressed air:

1) To blow dust or dirt from clothing.

2) As a blow gun for other cleaning purposes unless reduced to 30 psi or less and then only with effective chip guarding, PPE and controls to contain dust.

3) For cleaning up hazardous materials, such as anything that contains or could contain asbestos, lead or arsenic.

4004 Hoses and Attachments

A) Never allow the hose to kink.

B) Use coupler guards on air compressor hoses.

C) All hoses exceeding 0.5-inch inside diameter shall have a safety device at the source of supply (air branch line) to stop airflow in case of hose failure.

D) Near energized equipment:

1) Avoid using metal-reinforced hose unless proper clearances are maintained.

2) Use pneumatic tools with accumulators to collect moisture.

E) Make sure safety clips or retainers are securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

F) Chicago quick disconnects shall be secured by means of Chicago pins or other similar types of locking devices.

   1) When inserting the nozzle of a quick connect, hold the nozzle securely in order to prevent it from kicking and never kink the line to cut off the air.

G) Before making adjustments or changing air tools, shut off air at the valve ahead of the hose and bleed at the tool before breaking the connection.

H) Clean all fittings before connecting. (Exception: this does not apply to quick disconnect tools.)

I) **DO NOT** exceed the manufacturer's safe operating pressure for hoses, pipes, valves, filters and other fittings.

J) If a hose should break or separate, **DO NOT** attempt to stop it or use any kind of physical resistance. Shut down the system as soon as the leak is detected.

K) Do no use hoses for hoisting or lowering tools.

L) Use only impact sockets with impact wrenches.

M) Use metatarsal guards when operating jackhammers.

N) Never allow the tool speed to exceed the rated speed of the attachment.

4005 Hydraulic-Operated Tools

A) Inspect tools prior to use to identify any ill-fitting connections, worn or cracked hoses, or any other potential malfunction.

B) Avoid dropping or rough handling of hydraulic tools.

C) **DO NOT** allow hoses to kink.

D) If a hydraulic line should break, stay in the clear. **DO NOT** attempt to stop or slow down the leak by any kind of physical resistance. Shut down the system as soon as the leak is detected. (See *Section 3808 — Hydraulic Injection Prevention and Treatment.*)

E) Repairs on hydraulic tools shall be made only by qualified personnel.

F) Use only hydraulic tools designed and maintained for a work environment where they may contact energized electrical lines or equipment. This includes nonconductive hoses.

G) Use only hydraulic tools equipped with a constant pressure switch that shuts off the flow of fluid when the pressure switch is released.

H) Release pressure before breaking connections unless you are using quick-acting, self-closing connectors.

I) **DO NOT** use hoses to hoist or lower tools or equipment unless equipment is specifically designed to do so.

4006 Powder-Actuated Tools and Power Nailers

A) Only trained employees (licensed, when required) shall use these tools.

B) Operators and assistants using these tools shall wear all required PPE including safety glasses with side shields, face shields, hard hats and hearing and hand protection.

C) Always keep hands clear of the open barrel end.

D) Use only cartridges with an explosive charge adequate for the job and for proper penetration.

E) All explosive charges must be carried and transported in approved containers.

F) Always examine the material upon which these tools are to be used before a job to determine its suitability and eliminate potential hazards to the operator and others.

1) Fasteners shall not be driven into:

a) Easily penetrated material, unless such material is backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying hazard on the other side.

b) Brick or concrete any closer than 3 inches to an edge or corner.

c) Steel any closer than 0.5 inch from a corner or edge.

d) Very hard or brittle material that could chip or splatter, or make the fastener ricochet.

G) Prior to use, the operator shall:

1) Ensure that the protective shield, where applicable, is properly attached to the tool.

2) Inspect the tool to determine if it is clean, if moving parts operate freely and if the barrel is free from obstructions.

3) Test the tool according to the manufacturer's recommended procedure.

4) A defective tool shall be tagged as "Defective, Do Not Use" and immediately removed from service. It will remain tagged until repaired.

H) Tools shall be maintained in good condition and serviced regularly by qualified persons.

I) Tools shall not be:

1) Loaded until just prior to the intended firing.

2) Left unattended when loaded.

3) Pointed at anyone.

4) Used in explosive or flammable environments.

J) The operator shall be familiar with hang fire and misfire procedures.

1) In case of a misfire, the operator shall hold the tool in place for 30 seconds and then try to operate the tool a second time. In case of another misfire, the procedure can be repeated once more.

2) Test fires should never be pointed horizontally, unless work material is directly in front of the tool.

3) Misfired cartridges shall be disposed of properly. Refer to label for proper precautions.

K) When these tools are in use, access to the work area shall be controlled to protect other personnel.

L) Tools and cartridges should be stored in a secure room, cabinet or box when not in use.

4100 Vegetation Management Safety

A) When performing tree trimming or vegetation control, employees must wear all appropriate PPE at all times. At a minimum this includes hard hats, safety vests and safety glasses. Wear appropriate clothing and use insecticides on clothing to minimize risks from ticks and other insects. Use hearing protection when operating power tools/equipment such as chainsaws and brush chippers.

B) Vegetation control at substations:

1) At least one person on a crew entering a substation must have gone through Qualified Worker Hands Off (QWHO) training and received certification and keys for entry.

a) Follow all entry procedures. Upon entering a substation the crew leader shall call dispatch to report the crew is on the premises and describe the planned work.

b) Employees need to sign the log book upon entry.

c) Employees entering a substation must wear FR clothing.

d) A qualified safety watch (journeyman wireman) will be present whenever tree crews enter a substation.

C) Mitigating risk:

1) When trimming operations are occurring, the area of potential hazard from falling limbs and debris shall be identified (referred to as the drop zone).

a) No one enters the drop zone while trimming is in progress.

b) It is everyone's responsibility at the jobsite to prevent someone from entering the drop zone while work is occurring.

2) Trees and limbs should be roped as necessary to avoid potential damage to customer property.

3) A forester may be assigned to a job as well as a tree crew leader, as an observer to mitigate risk.

4) If a limb is greater than 4 inches in diameter, use extreme caution to remove it.

D) Transmission ROW:

1) Caution should be taken when traveling along transmission ROWs. When driving ROW roads, it may be necessary to stop occasionally to walk an area to ensure it is actually safe to drive on.

2) Know what wildlife may be present and what hazardous vegetation is in the area.

3) Gates to transmission ROWs should be locked at all times. If a gate or lock is damaged, report it so it may be replaced.

4) Know appropriate federal and state forest regulations, including fire protection requirements.

4200 Welding, Cutting, Brazing and Grinding

4201 General Requirements

A) Before starting operations:

1) Inspect and secure all connections.
2) Ensure the work lead is firmly attached to the work and that magnetic work clamps, if used, are freed from adherent metal particles or spatter on contact surfaces.
3) Spread out coiled welding cable before use to avoid serious overheating and damage to insulation.

B) Grounding:

1) Visually check grounding of the welding machine frame.
2) To avoid damage to plant equipment such as valve seats and bearing journals, take care when connecting a grounding strap for welding. **DO NOT** attach grounding straps in such a manner as to cause welding current to arc across these gaps.
3) When not in use, place electrode holders in such a manner that they cannot make electrical contact with persons, conducting objects, or fuel/compressed gas tanks.

4) **DO NOT** use cables with connections within 10 feet of the holder.

5) **DO NOT** coil or loop welding cable around parts of the body.

6) Never change polarity while the machine is under load.

7) **DO NOT** use electrode holders with defective jaws or with loose cable connections.

8) Take care when welding on valves containing parts that may be susceptible to heat damage (e.g., plastic or rubber parts). If possible, remove all parts that may become damaged prior to any welding. Inspect and secure all connections.

NOTE: Printed rules and instructions pertaining to safe operation of the equipment supplied by the manufacturers shall be posted on the machine and strictly followed.

C) General work practices:

1) After welding operations are completed, mark the hot metal or provide some other means of warning for other workers.

2) Place hot electrode stubs in a metal container to be disposed of upon completion of the welding.

3) Place welding cable and other equipment so that it is clear of passageways, ladders and stairways.

4) Report any equipment defect or safety hazard to your supervisor and discontinue use of the equipment until its safety has been ensured.

5) Thoroughly dry and test machines that have become wet before using them.

6) Prior to use, inspect work and electrode lead cables for wear and damage. Replace cables with damaged insulation or exposed bare conductors. Join lengths of work and electrode cables by using the connecting means specifically intended for the purpose.

4202 Welding/Hotwork Safety

A) Basic fire prevention measures:

1) Before cutting, welding, brazing, or grinding, inspect the area and indicate that the job requirements have been met by indicating a “yes” or “no” for each item on the Welding, Cutting and Grinding Permit (if applicable to your work area).

2) Ensure fire extinguishing equipment is readily available in any area where welding occurs and be trained in its use. Such equipment may consist of pails of water, buckets of sand, a hose, or portable extinguishers, depending upon the nature and quantity of the combustible material exposed.

3) Ensure ventilation ducts that might carry sparks to distant combustibles are suitably protected or shut off, or shut down fans.

4) If welding is to be done on a metal wall, partition, ceiling or roof, take precautions to prevent ignition of combustibles on the other side.

5) **DO NOT** allow cutting or welding on pipes or other metal in contact with combustible walls, partitions,

ceilings, or roofs if the work is close enough to cause ignition by conduction.

6) Ensure oxygen-acetylene equipment is free of leaks.

7) Be familiar with facilities for sounding an alarm in the event of a fire.

8) Watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm.

9) If necessary, maintain a fire watch for at least a half hour after completion of welding, cutting, or grinding operations to detect and extinguish possible smoldering fires.

10) Report all fires to the appropriate parties (supervisor, Control Room, System Control Center, etc.) in a timely manner.

11) **DO NOT** perform welding, cutting, grinding, or other hot work on used drums, barrels, tanks, or other containers until they have been cleaned or inerted and it is made certain there are no flammable materials present or any substances which, when subjected to heat, might produce flammable, explosive, or toxic vapors.

12) Vent and/or purge all hollow spaces, cavities, or containers to permit the escape of air or gases before preheating, cutting, or welding.

13) When arc welding is to be suspended for any substantial period of time, remove all electrodes

from the holders and locate the holders carefully so that accidental contact cannot occur and turn the machine off.

14) When gas welding, brazing, or cutting is to be suspended for any substantial period of time, close the torch valves and shut off all gas supply to the torch.

15) If the object to be welded, brazed, cut, or ground cannot readily be moved, remove all movable fire hazards in the vicinity.

16) If the object to be welded, brazed, cut or ground cannot be removed and if the fire hazards cannot be removed, protect all combustible material below and within a 35-foot radius with fire resistant curtains, metal guards, or flame-proof covers. Additionally, the following precautions apply:

    a) Wherever there are floor openings that cannot be closed, take precautions so that no readily combustible materials on the floor below will be exposed to sparks which might drop through the floor opening.

    b) Observe the same precautions with regard to cracks or holes in walls, open doorways and open or broken windows.

    c) These precautions include notification of employees to keep out of the area by posting signs and/or setting out barriers to preclude traffic. A fire watch may be needed depending on environmental conditions.

17) Fire watches are required where any of the following conditions exist:

a) Where cutting, welding, grinding, or open-flame work is performed above or within a radius of 35 feet of any open cables, flammable liquids, scaffold boards, paper, rags, or other objects on the same elevation of the work, or if combustible materials are below the work area where openings exist.

b) The work area is posted as "No Burning, Welding, or Open Flame Without Permission."

c) Appreciable combustibles are more than 35 feet away but are easily ignited by sparks.

d) Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

e) Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

4203 PPE

A) Eye protection: Wear a helmet with stationary safety glass for arc welding or arc cutting operations when exposed to direct or indirect light. If this safety lens is not inside the helmet, then wear safety goggles as well during arc welding or cutting operations.

NOTE: Safety glasses with side shields with suitable filter lenses are permitted for use during welding operations on light work, for torch brazing, or for inspection.

B) Skin protection:

1) Wear a helmet to protect the face, neck and ears from direct radiant energy from the arc.

2) Wear flameproof gauntlet gloves and cover skin completely by a double layer of clothing or equivalent.

NOTE: Pocketless, flameproof aprons may also be desirable as protection against radiated heat and sparks.

3) Keep sleeves and collars buttoned. **DO NOT** turn trousers or overall pant legs up on the outside. **DO NOT** wear polyester and synthetic fabrics while doing hot work.

4) Wear fire-resistant leggings, high boots (fully laced), or other equivalent means for heavy work.

5) Wear capes or shoulder covers made of leather or other suitable materials during overhead welding

or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

6) Wear ear protection for overhead welding and cutting, or welding and cutting in extremely confined spaces.

7) Where there is exposure to falling objects or a hazard of bumping in confined spaces, use hard hats or head protectors.

C) Respiratory protection may be required depending on the material type, ventilation available and area in which welding will be performed. See the ventilation section below. Contact PGE Safety & Resiliency – Industrial Hygiene for respiratory protection guidance.

4204 Work in Confined/Enclosed Spaces

A) When welding, brazing, or cutting is being performed in any confined space, ensure the gas cylinders and welding machines are left on the outside. Before operations are started, securely block heavy portable equipment mounted on wheels to prevent accidental movement.

B) Welding or cutting operations involving fluorine compounds, zinc, lead, beryllium, cadmium, mercury, cleaning or degreasing compounds, or stainless steel shall be considered the same as working in a confined space.

C) Follow applicable confined/enclosed space entry procedures. (See *Section 1800 — Confined and Enclosed Spaces*.)

D) Ensure all welding, brazing and cutting operations carried on in confined spaces are adequately ventilated to prevent the accumulation of toxic materials and/or possible oxygen deficiency. This applies not only to the welder but also to helpers and other personnel in the immediate vicinity.

E) In circumstances where adequate ventilation is not possible, the self-contained breathing apparatus or airline respirators shall be worn.

F) Ventilation:

1) Provide mechanical ventilation in a space of less than 10,000 cubic feet per welder, in a room having a ceiling height of less than 16 feet and in places restricting cross ventilation.

2) Ventilation shall be at the minimum rate of 2,000 cubic feet per minute per welder, except where local exhaust hoods and booths or respirators are provided.

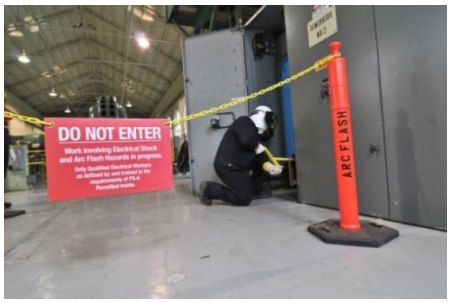
3) When welding must be performed in a space screened on all sides, the screens shall be so arranged to ensure no serious restriction to ventilation.

4300 Work Area Protection – Signs/Signals/Barricades

4301 Physical Barriers and Barricades

A) Safety barriers and barricades are used to identify electrical, water, environmental, hydraulic, steam, and atmospheric hazards and to prevent contact with potentially dangerous energized equipment. Yellow and black tape indicates caution areas. Never enter any area that is barricaded with red tape and marked as “Do Not Enter” with appropriate signage, unless you are a qualified electrical worker or a person under their supervision.

B) Install safety barriers and barricades at all work sites before starting the job. Styles and quantities are at the discretion of the person in charge of the work.



C) Ask a supervisor for approval if installing barriers/barricades compromises electrical clearance or safety.

4302 Traffic Control and Flagging

A) PGE has adopted the ODOT *Manual for Traffic Control and Flagging* as the company guide for work zone traffic control and flagging. Manuals are available from safety coordinators and flagging instructors.

4303 Work Site Visitors

A) Routine visits or extended presence of employee's family or friends during work hours is a distraction hazard and is discouraged. This includes visits from PGE off-duty personnel. Visitors adversely affect work efficiency, place themselves in danger and create significant liability for the company.

4304 Work Sites Exposed to Vehicle Traffic

A) PGE follows the rules outlined in the current Oregon Temporary Traffic Control Handbook (OTTCH) for operations of three days or less. To get a hard copy of the handbook, you can contact PGE Technical Training (503-582-5042) or go to http://www.oregon.gov/ODOT/Engineering/Pages/OTTCH.aspx.

B) Employees shall wear vests, raingear or apparel that meets the ANSI 107 standard for reflectivity. If the employee's work involves exposure to an arc or flash, these items shall be FR/arc rated.

4400 Working Around Water

4401 General Safety Rules

A) Operating boats:

1) A Boater's Education Card is required to operate boats greater than 10 horsepower.
2) When boats are moored, secure them using lines that can withstand the shock load from waves and wind.
3) Workboats shall be equipped with a pair of oars and a ring buoy attached with a 90-foot coil of 0.5-inch line.

B) These rules apply when working around water and danger of drowning exists:

1) Workers in the water must wear Coast Guard-approved or equivalent wearable personal flotation devices (PFDs).
2) Workers over water on floating or unstable surfaces must wear Coast Guard-approved or equivalent wearable PFDs.

3) Piers, docks, wharves and work sites along developed shorelines must have rescue devices available within 200 feet of the water or shoreline work area.

   a) A rescue device is defined as: A ring buoy and line, gaff pole, throwable rescue device or other device that serves as means to rescue somebody from water without requiring a rescuer to enter the water.

4) Life jackets or buoyant work vests are not required when continuous fall protection is in use.

NOTE: Be familiar with and follow the specific procedures for your work location.

C) When working over or near water, the employee or employee in charge must assess drowning hazards to determine what measures are required and document it on the tailboard. Relevant factors to consider include body of water (e.g., river, canal, stream), depth, absence or presence of current, height above water surface and use of fall protection.

4402 Barges, Boats and Docks

A) Always wear approved life jackets or belts and a lifeline while working over or near water.

B) Always inspect work vests or life preservers for defects that would lessen strength or buoyancy prior to and after each use.

C) Workers on piers, docks, wharves and work sites along developed shorelines must have rescue devices

available within 200 feet of water or shoreline work areas.

1) A rescue device is defined as a ring buoy and line, gaff pole, throwable rescue device or other device that serves as means to rescue somebody from water without requiring the rescuer to enter water.

2) Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

D) Only qualified employees shall operate company boats.

E) Lifeboats and workboats must be equipped with oars.

F) All boats must have ring buoys attached with a 50-foot coil of 0.5-inch line.

G) Employees shall stay clear of barge cables while barges are moved.

H) When barges are moored at docks, be careful securing mooring lines. The lines should be loose enough to allow sufficient movement of the barge when there is wake from passing boats, but tight enough to permit people to pass from dock to barge.

I) Before performing work on a barge, be sure gunwales and end decks are cleared of any debris.

Appendices

Acronyms **325**
Crane Signaling **327**
Definitions **329**
Indexed Terms **355**

Acronyms

AC – Alternating current

ACM – Asbestos-containing material

AED – Automated electronic defibrillator

ANSI – American National Standard Institute

ASTM – American Society of Testing and Materials

CCVT – Coupling capacitor voltage transformer

CFR – Code of federal regulations

CDC – Centers for Disease Control

CDL – Commercial motor vehicle license

CMV – Commercial motor vehicle

CO – Carbon monoxide

CPR – Cardiopulmonary resuscitation

CT – Current transformer

dBA – Decibels on A-weighted scale

DEET – Diethyltoluamide

DC – Direct current

DEQ – Department of Environmental Quality

DMV – Department of Motor Vehicles

DOT – Department of Transportation (federal)

EMS – Emergency medical services

FOC – Fiber optic cable

FERC – Federal Energy Regulatory Commission

FPE – Fall protection equipment

FR – Flame resistant

GFI – Ground fault interrupter

GVWR – Gross vehicle weight rating

HCP – Hearing conservation program

Acronyms

HRC – Hazard risk category

H2S – Hydrogen sulfide

LOTO – Lockout-tagout

LTC – load tap changer

MAD – Minimum approach distance

MPE – Maximum permissible exposure

MUTCD – Manual on Uniform Traffic Control Devices

NEC – National electric code

NESC –National electrical safety code

OAR – Oregon Administrative Rule

ODOT – Oregon Department of Transportation

OPGW – Optical ground wire

Oregon OSHA – Oregon Occupational Safety and Health Administration

ORS – Oregon Revised Statutes

OSHA – Occupational Safety and Health Act

PEL – Permissible exposure limit

PPM – Parts per million

PCB – Polychlorinated biphenyl

PPE – Personal protective equipment

PT – Potential transformer

QWHO – Qualified worker hands off

RF – Radio frequency

ROW – Right-of-way

SDS – Safety data sheet

SO2 – Sulfur dioxide

STS – Significant threshold shift

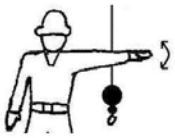
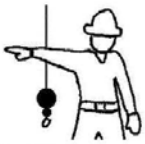
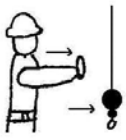
TWA – Time-weighted average

URD – Underground residential distribution

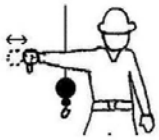
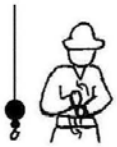
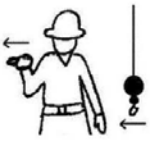
WNV – West Nile Virus

Crane Signaling

Standard Hand Signals

 **STOP –** With arm extended horizontally to the side, palm down, arm is swung back and forth.	 **EMERGENCY STOP** – With both arms extended horizontally to the side, palms down, arms are swung back and forth.	 **HOIST –** With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.
 **RAISE BOOM** – With arm extended horizontally to the side, thumb points up with other fingers closed.	 **SWING** – With arm extended horizontally, index finger points in direction that boom is to swing.	 **RETRACT TELESCOPING BOOM** – With hands to the front at waist level, thumbs point at each other with other fingers closed.
 **RAISE THE BOOM AND LOWER THE LOAD –** With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.	 **DOG EVERYTHING** – Hands held together at waist level.	 **LOWER** – With arm and index finger pointing down, hand and finger make small circles.
 **LOWER BOOM** – With arm extended horizontally to the side, thumb points down with other fingers closed.	 **EXTEND TELESCOPING BOOM** – With hands to the front at waist level, thumbs point outward with other fingers closed.	 **TRAVEL/TOWER TRAVEL** – With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.

Crane Signaling

 **LOWER THE BOOM AND RAISE THE LOAD** – With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.	 **MOVE SLOWLY** – A hand is placed in front of the hand that is giving the action signal.	 **USE AUXILIARY HOIST** (whipline) – With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.
 **CRAWLER CRANE TRAVEL, BOTH TRACKS** – Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward.	 **USE MAIN HOIST** – A hand taps on top of the head. Then regular signal is given to indicate desired action.	 **CRAWLER CRANE TRAVEL, ONE TRACK** – Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.
 **TROLLEY TRAVEL** – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.		

Definitions

Aerial Device: Any piece of equipment utilizing a bucket or platform to place the worker(s) at an elevated worksite.

Affected Employee: An employee whose job requires him to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tag-out, or whose job requires him to work in an area in which such servicing or maintenance is being performed.

Alive or Live: Electrically connected to a source of potential difference or electrically charged so as to have a potential significantly different from that of the earth in the vicinity. The term “live” is sometimes used in place of the term “current-carrying,” where the intent is clear, to avoid repetition of the longer term.

Alternating Current (AC): An electric current that reverses direction of flow at regular intervals and has alternately positive and negative values.

Anchorage: A secure means of attachment for lifelines, lanyards and straps.

Approved: The term “approved,” when used in connection with methods, tools or equipment, refers to the methods, tools or equipment approved by PGE through committee, departmental action or safety rule.

Arc Flash Boundary: Specific approach boundaries designed to protect employees while working on or near energized equipment. This distance is not common between equipment. Some equipment will have a greater flash protection boundary while other equipment will have a lesser boundary.

- **Flash Protection Boundary (outer boundary):** The flash boundary is the farthest established boundary from the

energy source. If an arc flash occurred, this boundary is where an employee would be exposed to a curable second degree burn (1.2 calories/cm^2).

- **Limited Approach:** An approach limit at a distance from an exposed live part where a shock hazard exists.
- **Restricted Approach:** An approach limit at a distance from an exposed live part which there is an increased risk of shock.
- **Prohibited Approach (inner boundary):** A distance from an exposed part which is considered the same as making contact with the live part.

Arc Flash Hazard: A dangerous condition associated with the release of energy caused by an electric arc.

Arc Rating: The value for fabrics that describes their performance under exposure to an electrical arc discharge. Testing determines when the amount of exposure results in a 50% probability of causing the onset of a second-degree skin burn. The arc rating is expressed in cal/cm^2.

Attendant: An employee assigned to remain immediately outside the entrance to an enclosed or confined space to render assistance as needed to employees inside the space.

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

Automated External Defibrillator (AED): A device that automatically analyzes the heart rhythm and, if it detects a problem that may respond to an electrical shock, that permits a shock to be delivered to restore a normal heart rhythm.

Automatic Circuit Recloser: A self-controlled device for interrupting and reclosing an alternating current circuit with a predetermined sequence of opening and reclosing followed by resetting, hold-closed, or lockout operation.

Back Feed: A means of energization from a source other than that from which the circuit is normally energized. Such sources of back feed include but not limited to:

- Personal generators
- Wind generators
- Solar generators
- Tertiary windings in a transformer

Backreamer: A downhole tool that increases the diameter of a pilot bore hole to accommodate the size of the product being pulled.

Barrier: A physical obstruction that is intended to prevent contact with energized lines or equipment or to prevent unauthorized access to a work area.

Barricade: A physical obstruction such as a tapped off area, A-frame type wood, or metal structures intended to warn and limit access to a hazardous area.

Baseload: A power plant that is planned to run continually except for maintenance and scheduled or unscheduled outages. Baseload also refers to the minimum load in a power system over a given period of time.

Benching (Benching System): A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal steps, usually with vertical or near vertical surfaces between levels,

Body Harness: Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders, with means for

attaching it to other components of a personal fall arrest system.

Bond: The electrical interconnection of conductive parts designed to maintain a common electrical potential.

Bus: A conductor or a group of conductors that serves as a common connection for two or more circuits.

Bushing: An insulating structure, including a through conductor or providing a passageway for such a conductor, with provision for mounting on a barrier, conducting or otherwise, for the purposes of insulating the conductor from the barrier and conducting current from one side of the barrier to the other.

Bypass: A method which allows for service continuity to the customer while the meter is removed for test or inspection.

Cable: A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

Cable Sheath: A conductive protective covering applied to cables (may consist of multiple layers, one or more of which is conductive).

Capacitance: The ratio of the change in an electric charge in a system to the corresponding change in its electric potential.

Capacity: The maximum power that can be produced by a generating resource at specified times under specified conditions.

Catastrophic Release: A major uncontrolled emission, fire, or explosion involving one or more highly hazardous chemicals that presents serious danger to employees in the workplace.

Circuit: A conductor or system of conductors through which an electric current is intended to flow.

Clear Live-Line Distance: The minimum distance for the use of live-line tools held by linemen when performing live-line work.

Clearance: Authorization to perform specified work or permission to enter a restricted area.

Combustible Liquid: Any liquid having a flash point at or higher than 140o F and less than 200o F. (Also see Flammable Liquid.)

Common Meter: A non-residential meter for general energy use in apartment complexes and multi-occupancy buildings. General energy use includes common area and exterior lighting, irrigation, laundry rooms, etc. Also called a house meter.

Communication Lines: The conductors and their supporting or containing structures that are used for public or private signal or communication service.

NOTE: Telephone, telegraph, railroad signal, data, clock, fire, police-alarm, community television antenna, fiber-optics and other similar systems are included.

Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.

Conductor: A material, usually in the form of a wire, cable, or busbar, suitable for carrying an electric current.

Confined Space: A space that is large enough and so configured that an employee can bodily enter and perform assigned work; has limited or restricted means for entry or exit (some examples are tanks, vessels, silos, storage bins, hoppers, vaults, pits, penstocks and dike areas); is not designed for continuous employee occupancy; and has one or more of the following characteristics: contains or has a known potential to contain a

hazardous atmosphere, contains a material with the potential for engulfment of an entrant, 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, or contains any other recognized serious safety or health hazard. (See also Enclosed Spaces.)

Contractor: Organization contracted by the company to perform work on company property.

Covered Conductor: A conductor covered with a dielectric having no rated insulating strength or having a rated insulating strength less than the voltage of the circuit in which the conductor is used.

Current-Carrying Part: A conducting part intended to be connected in an electric circuit to a source of voltage. Non-current-carrying parts are those not intended to be so connected.

Customer: The individual requesting electrical service from the utility/company.

De-energized: Free from any electrical connection to a source of potential difference and from electrical charge; not having a potential different from that of the earth.

Defibrillator: A device used to correct a dangerously abnormal heart rhythm, usually ventricular fibrillation, or to restart the heart by depolarizing its electrical conduction system and delivering brief measured electrical shocks to the chest wall or the heart muscle itself. (Also see Automated External Defibrillator.)

Designated Person: See Authorized Person.

Dielectric Overshoes: Rubber shoes worn over the top of normal shoes. They are worn by people who are at risk of electric shock due to working near or contact with live electricity.

Direct-Connect Meter: A meter energized to line voltage that carries all the load current. Also called a self-contained meter. No current transformer or voltage interface is used.

Direct-Connect Socket: A meter socket connected to service wires, energized to line voltage and in series with the customer's load without external instrument transformers. A self-contained meter is used in a direct-connect socket.

Direct Current (DC): An electric current that flows in one direction with a magnitude that does not vary or that varies only slightly.

Directional Boring Machine: A steerable, horizontal boring machine that allows trenchless installation of underground utilities.

Disconnected: A separated or broken connection from any energy source.

Dispatch: See System Control Center.

Effectively Grounded: Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages that may result in undue hazard to connected equipment or to persons.

Electric Line Truck: A truck used to transport personnel, tools and material for electric supply line work.

Electric Supply Equipment: Equipment that produces, modifies, regulates, controls, or safeguards supply of electrical energy.

Electric Supply Lines: Conductors used to transmit electrical energy and their necessary supporting or containing structures. Signal lines of more than 400 volts are always supply lines within this section and those with less than 400 volts are considered as supply lines if so run and operated throughout.

Emergency: An emergency occurs when an unusual condition exists that endangers life and/or property.

Definitions

Employee: In the broad sense, any person employed by or representing the company. In general usage, a person employed by the company and below the level of supervisor.

Enclosed: Surrounded by a case, cage, or fence that will protect the contained equipment and prevent accidental contact of a person with live parts.

Enclosed Space: A working space, such as a vault or manhole that has a limited means of egress or entry, is designed for periodic employee entry under normal operating conditions, and does not, under normal conditions, contain a hazardous atmosphere but may contain a hazardous atmosphere under abnormal conditions. (Also see Confined Space.)

Energized (also Alive or Live): Electrically connected to a source of potential difference or electrically charged so as to have a potential different from that of the earth or different from that of adjacent conductors or equipment.

Energy-Isolating Device: A physical device that prevents the transmission or release of energy, including, but not limited to, the following: a manually operated electric circuit breaker, a disconnect switch, a manually operated switch, a slide gate, a slip blind, a line valve, blocks and any other similar device with a visible indication of the position of the device (push buttons, selector switches and other control circuit type devices that are not energy-isolating devices).

Energy Source: Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal, or other energy source that could cause injury to personnel.

Equipment (Electric): A general term including material, fittings, devices, appliances, fixtures, apparatus, etc. used as part of or in connection with an electrical installation.

Equipotential Zone (Grounding): An equipotential zone is a work zone in which the worker is protected from electric shock from differences in electrical potential between objects in the work area. These differences in potential can be caused by induced voltage, line re-energization, or lightning. The worker in an equipotential zone is protected from electric shock because there is a near identical state of electrical potential between any two points on the body.

Excavations: Any man made cut, cavity, trench, or depression in an earth surface formed by earth removal.

Exposed: (a) In such position that in case of failure of supports or insulation, contact with another circuit or line may result or (b) An object or device that can be inadvertently touched or approached nearer than a safe distance by any safe person. Applied to objects not suitably guarded or situated. Not isolated or guarded.

Exposure: Exposure occurs whenever and wherever a person is subjected to electric, magnetic, or electromagnetic fields or to contact currents other than those originating from physiological processes in the body and other natural phenomena. May also refer to hazardous materials and noise.

Fall Prevention Equipment: Any equipment, device or system that prevents accidental falls from elevations or mitigates the effect of such falls.

Fall Restraint Equipment: Any device that, when properly adjusted and combined with other subcomponents and elements, restricts falls if a climber loses contact with a structure. Examples include Buckingham Bucksqueezes and JELCO Pole Chokers (for wood poles) and Petzl rope grab devices attached to lifeline ropes (for towers/lattice structures).

Fiber Optic Cable (FOC): A cable containing one or more optical fibers that are used to carry light. The optical fiber elements

are typically individually coated with plastic layers and contained in a protective tube suitable for the environment where the cable will be deployed.

Fault Current: Current that flows from a source through a conductor to a point where there is a conductive connection between that conductor and earth, and back through the earth to the source. The lower the resistance of the entire circuit, the higher the fault current.

Federal Energy Regulatory Commission (FERC): A federal agency responsible for regulating key activities of the nation's natural gas utilities, electric utilities, natural gas pipeline transportation utilities and hydroelectric power producers.

Flame Resistant (FR): A fabric or product that resists ignition and self-extinguishes after removal of the ignition source.

Flammable Liquid: Any liquid having a flash point less than 140° F and having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100° F. (Also see Combustible Liquid.)

Flares: The word "flares" shall be used to indicate flares, torches, fuses, red lanterns, reflectors, or any other equipment that is adaptable for the purpose of giving a visible source of light for warning or notification.

Foreman or Supervisor: Any person, regardless of classification, who is directly in charge of a specific job or specific jobs. (Depending upon local classification, this person may be a "lead man," working foreman, foreman, general foreman, supervisor, or superintendent.)

Free Fall: The act of falling before the personal fall protection system begins to arrest the fall.

Governmental: Any type of political agency having control over a certain activity, including federal, state, county, township, city, etc.

Ground (noun): The connection, established either intentionally or accidentally, of an electric circuit or equipment with reference ground through a conductor, or other conducting object or substance.

- **Reference Ground:** That conductive body, usually earth, to which an electric potential is referenced.

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

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

Grounding Electrode (Ground Electrode): A conductor embedded in the earth, used for maintaining ground potential on conductors connected to it and for dissipating into the earth current conducted into it.

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

Hazard Communication Program: Utility-developed program to ensure that information concerning hazardous chemicals

(material) is transmitted to employees through the use of warnings, procedures, Safety Data Sheets and employee training.

Hazard Risk Category (HRC): A term used specifically in NFPA 70E that establishes categories of protective clothing and personal protective equipment to be worn during specific tasks. Each category outlines minimum arc rating (cal/cm^2) for the FR clothing and other PPE.

Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment of the ability to self-rescue (escape unaided from an enclosed or confined space), injury, or acute illness from one or more of the following causes: (1) flammable gas, vapor or mist in excess of 10 percent of its Lower Explosive Limit (LEL); (2) airborne combustible dust at a concentration that meets or exceeds its LEL; (3) atmospheric oxygen concentration below 19.5 percent or above 23.5 percent; (4) atmospheric concentration of any substance for which a dose or a Permissible Exposure Limit (PEL) is published in 29 CFR 1910, Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or PEL; and (5) any other atmospheric condition that is immediately dangerous to life and health (IDLH).

Hazardous Material (Substances): Any substance that is a physical hazard or health hazard. A substance is a physical hazard when there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water reactive. The substance is a health hazard when it is determined to be a carcinogen, a toxic or highly toxic agent, a reproductive toxin, irritant, corrosive, sensitizer,

hepatotoxin, nephrotoxic, neurotoxin, an agent that acts on the hematopoietic system, or an agent that damages the lungs, skin, eyes, or mucus membranes.

High Power Tests: Tests in which fault currents, load currents and line dropping currents are used to test equipment, either at the equipment's rated voltage or at lower voltages.

High Voltage Test: Tests in which voltages of approximately 1,000 volts are used as a practical minimum and in which the voltage source has sufficient energy to cause injury.

High Wind: A wind of such velocity that an employee would be exposed to being blown from elevated locations and employee or material-handling equipment could lose control of material being handled, or an employee could be exposed to other hazards not controlled by the standard involved. Winds exceeding 40 miles per hour (mph), or winds exceeding 30 mph if material handling is involved, are considered to be high winds unless precautions are taken to protect employees from the hazardous effects of the wind.

Highly Hazardous Chemical: A substance possessing toxic, reactive, flammable, or explosive properties that are listed in the Occupational Safety and Health Act (OSHA) Standard 29 CFR 1910.119.

Hot Work Permit: A permit to do work that may result in temperatures or sparks capable of supporting ignition of flammable or combustible materials.

House Meter: A nonresidential meter for general energy use in apartment complexes, multi-use, or other multi-occupancy buildings. General energy use includes common area and exterior lighting, irrigation, laundry rooms, etc. (Also called a common meter)

Hub: A conduit attachment in, or out of, a meter base can, into which electrical connections may be plugged.

Immediate Danger to Life and Health: Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from an enclosed or confined space.

Insulated: Separated from other conducting surfaces by a dielectric substance or air space; permanently offering a high resistance to the passage of current and to disruptive discharge through the substance or space.

Isolated: A circuit or object that is not readily accessible to persons unless special means of access are used.

Jobsite: The point where the employees are assembled to perform the work.

Lanyard (Strap): A flexible line used to secure a body harness to a lifeline or directly to a point of anchorage.

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

Line Clearance Tree Trimmer: An employee who, through related training or on-the-job experience or both, is familiar with the special techniques and hazards involved in line clearance.

Line Clearance Tree Trimming: The pruning, trimming, repairing, maintaining, removing or clearing of trees or the cutting of brush that is within 10 feet (305 cm) of electric supply lines and equipment.

Live-Line Tools and Ropes: Those tools and ropes that are specially designed for work on energized lines and equipment operating at 600 volts and greater. Insulated aerial equipment specially

designed for work on energized lines and equipment shall be considered “live-line”.

Load Dispatch Operator: Person designated by the employer as having authority over switching and clearances of high-voltage lines and station equipment.

Load Tap Changer (LTC): A connection point along a transformer winding that allows the number of turns to be selected. By this means, a transformer with a variable turns ration is produced, enabling voltage regulation of the secondary side.

Lower Explosive Limit (LEL): The lower end of the concentration range (usually expressed in volume percent) of a flammable solvent at a given temperature and pressure for which air/vapor mixtures can ignite.

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

Manhole Opening: An opening through which persons may enter into a confined or enclosed space.

Manual Link Bypass: A bypass facility requiring the physical act of placing links across the line and load bypass studs, for the purposes of removing the meter and preventing an outage while maintaining service continuity.

Material Safety Data Sheet: See Safety Data Sheet

Maximum Permissible Exposure (MPE) Limits: The maximum electric and magnetic field strengths or their plane wave equivalent power densities to which a person may be exposed without harmful effect and with an acceptable safety factor as determined by the Federal Communication Commission’s latest regulation.

Meter: A device that measures and records the summation of electrical quantity over a period of time.

Meter Socket Continuous Rating: The rating, in amperes, that a meter socket will continuously carry for three hours or more under stated conditions without exceeding the allowable temperature rise. Typical continuous duty ratings of sockets include 80, 160 and 320 amps (ANSI C12.7).

Meter Socket Maximum Rating: The maximum rating of a meter socket in amperes; 125 percent of the continuous rating (EUSERC Section 300). Maximum ratings include 100, 200 and 400 amps.

Meter Base: The mounting device consisting of jaws, connectors and enclosure for socket-type meters. A mounting device may be either single or trough. The meter base is also referred to as a meter socket.

Meter Base Ring: A metallic ring secured to the meter base that can be sealed by the power company.

Meter Pedestal: A commercially-built pedestal that contains a meter base and customer disconnect switches.

Metered Service Conductor: A conductor carrying customer load that is recorded by the power company's billing meter.

Minimum Approach Distance (MAD): The closest distance an employee is permitted to approach an energized or a grounded object.

National Electrical Safety Code (NESC): NESC sets the ground rules for practical safeguarding of persons during the installation, operation, or maintenance of electric supply and communication lines and associated equipment. The NESC contains the basic provisions that are considered necessary for the safety of employees and the public under the specified conditions.

Near Miss: ***A near miss is defined*** as any event that could have, under slightly different circumstances, caused injury, illness, death, property damage, loss of materials or environmental damage.

National Electric Code (NEC): The most recent publication of the National Electrical Code adopted by the state.

Net Metering: A debit and credit metering process in an account in which the customer owns and operates a qualified generating device that interconnects with the power company's electrical facilities. Net metering tariffs are available upon request.

Network Metering: Single-phase service obtained from two of the phase wires and the neutral of a 4-wire system.

Occupational Safety and Health Act (OSHA) of 1970: Requires employers to provide to employees a workplace free from recognized hazards and to comply with safety and health standards established by the Act. The Act also charges each employee with a legal duty to comply with the Act's safety and health standards. The federal Act pertains to most employers but specifically excludes federal, state and local government employees. However, numerous states have developed safety and health standards that require compliance by all government entities.

Optical Ground Wire (OPGW): A dual-functioning cable designed to replace traditional static/shield/earth wires on overhead transmission lines with the added benefit of containing optical fibers which can be used for telecommunications purposes.

Pad Mount: Transformer or equipment in a surface-mounted enclosure normally worked from ground level.

Permissible Exposure Limits (PELs): Regulatory limits on the amount or concentration of a substance in the air. They may

also contain a skin designation. OSHA PELs are based on an eight-hour time weighted average (TWA) exposure.

Permit-Required Confined Space: A confined space that has one or more of the following characteristics: (1) contains or has a potential to contain a hazardous atmosphere; (2) contains a material that has a potential for engulfing an entrant; (3) has an internal configurations such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor with slopes downward and tapers to a smaller cross section; or (4) contains any other recognized serious safety or health hazard.

Personal Monitoring Device: A monitoring device designed to be worn by an employee that collects exposure data (e.g., personal noise dosimeter).

Personal Protective Equipment: Protective clothing, hard-hats, safety glasses, goggles, gloves, or other gear designed to protect the wearer's body or clothing from injury by electrical hazards, heat, chemicals and infection, for job-related occupational safety and health purposes.

Personal Protective Grounds: Grounding jumpers installed between the phase conductors and ground or adequate system neutral conductor, at or near the work site.

Physically Render Inoperative: The use of locks, blind flanges, or other similar devices or procedures to prevent the operation of switches, breakers, valves and operating controls.

Polychlorinated Biphenyls (PCBs): A hazardous nonconductive and noncombustible liquid used in some transformers and capacitors. It has several trade names — Pyranol, Askeral, Interteen, etc.

Positioning Device: A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical

surface, such as a wall or pole and work with both hands free while leaning. These devices may permit a fall of up to 2 feet. The device may only be used on a vertical surface (not horizontal).

Pre-job Briefing/Tailboard: A meeting in which the employee in charge is required to discuss, at a minimum, the following subjects: hazards associated with the job, work procedures involved, special precautions, energy source controls and personal protective equipment (PPE) requirements.

Primary Compartment: A compartment containing voltages more than 600 volts.

Primary Voltage: Any electrical circuit that normally operates at more than 600 volts.

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

Public: Any individual not an employee or representative of the utility/company.

Qualified Person (for Generation, Transmission and Distribution): One knowledgeable in the construction and operation of the electric power generation, transmission and distribution equipment involved, along with the associated hazards. Qualified employees shall be trained and competent in: (1) the skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment; (2) the skills and techniques necessary to determine the nominal voltage of exposed live parts; (3) the minimum approach distances corresponding to the voltages to which the qualified employee will be exposed; and (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 electrical equipment. An employee who is undergoing on-the-job training must meet the full requirements of fall protection.

NOTE: For the purposes of being qualified as defined above, employees that have completed an apprenticeship program or are qualified by experience or training and have demonstrated competency in their respective craft as determined by operational management shall be deemed qualified.

Qualified Person (in general): A qualified person is one who is specifically qualified to do a particular job because of education, training and/or experience. It is possible, even likely, that a qualified person in one context or situation would not be a qualified person in another situation.

Radio Frequency (RF): For the purposes of the Federal Communications Commission (FCC) standard, the frequency range is from 3 kilohertz (kHz) to 300 gigahertz (GHz).

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

Registered Professional Engineer: A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer registered in any state is deemed to be a “registered professional engineer” within the meaning of this standard when approving designs for “manufactured protective systems” or “tabulated data” to be used in interstate commerce.

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

Roadway: The road and the areas immediately adjacent thereto, such as the shoulder of the road, parking strip, etc. This area normally extends approximately 15 feet from the road.

Rope Grab: A device that attaches to a lifeline as an anchoring point to provide a means for arresting a fall.

Safety Data Sheet: A document provided by manufacturers and importers of chemicals to convey information to the users of their products. The information includes data on physical characteristics; fire and explosion hazards; reactivity; and health hazards; special precautions; and fire and spill procedures.

Safety Can: An approved closed container designed to store flammable liquids of not more than 5 gallon capacity (e.g., gas can) having a flash-arresting screen, spring-closing lid and spout cover and designed so that it will safely relieve internal pressure when subjected to a fire.

Safety Rule: A rule requiring compliance by all employees concerned. Deviation from safety rules is not permitted and is subject to disciplinary action.

Secondary Compartment: A compartment containing voltages less than 600 volts.

Secondary Voltage: Any electrical circuit that normally operates at less than 600 volts.

Shall or Must: When the word “shall” or “must” appears in the wording of a rule, the rule is to be obeyed as written. (A mandatory requirement.)

Shield (Shield System): A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure (e.g., “coffin”). Shield structures can be permanent or portable and moved along as work progresses.

Shoring (Shoring System): A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Should: When the word “should” appears in the wording of a rule, the rule is to be obeyed as written when it is reasonable or practical to do so. (An advisory requirement.)

Sloping (Sloping System): A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as soil type, environmental conditions of exposure and application of surcharge loads.

Snap-Hook: A self-closing device with a keeper, latch, or other similar arrangement that will remain closed until manually opened. Such devices include self-closing, single-action, double-action, or double-locking snap-hooks.

Snap-Hook (Double Locking): A self-closing device that includes a spring-loaded latch, biasing the latch into a closed position, which will remain closed until manually opened. Further, a locking means, also spring-loaded, is provided to help prevent the latch from inadvertently becoming opened, thus maximizing the safety factor of the hook.

Spike: A tool used to ensure underground electric power cables are de-energized. Also can refer to the process of ensuring that underground electric power cables are de-energized.

Stable Rock: Natural solid mineral material that can be excavated with vertical sides and which will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Step Bolt: A bolt or rung attached at intervals along a structural member and used for foot placement during climbing or standing.

Strike Sensing System: A system with dual circuits to measure elevated electrical potential on the directional boring machine and current flow along the drill string.

Supervisor: See Foreman.

Switch: A device that can break an electrical circuit, interrupting the current or diverting it from one conductor to another. In this manual, a switch is understood to be manually operable, unless otherwise stated.

Swivel: Joins a backreamer assembly to a conduit adapter, and permits the backreamer to rotate without turning the conduit that is being pulled in. It is also a device that can be placed between a pull line and a conductor being strung to allow the pull line and conductor to rotate.

System Control Center: See Load Dispatch Operator.

Tailboard Safety Talk: A discussion of the work to be accomplished and the safety measures to be incorporated. Normally conducted by the foreman, these discussions are sometimes referred to as “tailgate talks,” “tool box talks” or “5-minute safety talks.” (See also Pre-job Briefing.)

Transferring: The act of moving from one distinct object or location to another.

Transformer: A device used to transfer electric energy from one circuit to another.

Transitioning: The act of moving from one location to another on equipment or a structure while going around or over an object.

Underground Residential Distribution (URD): A general term that covers the necessary facilities to furnish underground service, generally to residential and commercial customers and usually through directly buried cable.

Unsafe Conditions: Used to indicate dangerous conditions, hazardous conditions, defective conditions, or unusual conditions that could be conducive to accidents.

Utility: An entity that has jurisdiction and control over the operation of the utility (including such entities as municipal utilities, electrical cooperatives, etc.)

Vault: An enclosure above or below ground, which personnel may enter, used for installing, operating, and/or maintaining equipment and/or cable.

Vented Vault: A vault that has provision for air changes using exhaust flue stacks and low level air intakes operating on differentials of pressure and temperature, providing for airflow which precludes a hazardous atmosphere from developing.

Voltage: The effective (root mean square [RMS]) potential difference between any two conductors or between a conductor and ground. The voltage specified in this manual shall mean the effective voltage to which the personnel or protective equipment may be subjected. Secondary voltage includes voltages up to 600 volts. Primary voltage shall mean voltages in excess of 600 volts.

Voltage of an Effectively Grounded Circuit: The voltage between any conductor and ground, unless otherwise indicated.

Voltage Limiter: A device used to detect potential differences between the directional boring unit and ground.

Warning Signs: For the purpose of these rules, any sign or similar means of employee or public notification alerting an employee to an actual or possible hazard. Included are “Danger” signs, “Caution” signs, traffic protection signs, instructional signs and informational signs.

Wireless Electronic Devices: This includes portable telecommunication devices that use electromagnetic waves to carry a signal over part of all of the communication path rather than a wired connection. Examples include but are not limited to telephones, laptop computers, tablets and portable music players.

Work-Positioning Equipment: Equipment used to support a climber on a structure so the climber’s hands are free when he or she reaches work position. For wood poles, the combination of a pole strap, skid, body belt and/or a harness and hook/gaffs constitutes WPE. For towers/lattice structures, the combination of a harness and two skids constitutes WPE.

Worksite: The location on the structure or equipment where, after the worker has completed climbing (horizontally and vertically), the worker is in position to perform the assigned work or task.

Work Zone: An area (usually a roadway) where road user conditions have changed because of a work zone or incident by the use of temporary traffic control devices, flaggers, police, or other authorized personnel.

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