

Oregon OSHA Proposes Changes to Division 2/S, General Industry/Electrical June 2007

NOTE: In addition to the amendments in the February 14, 2007 Federal Register, OR-OSHA proposes the following changes.

Text to be repealed/removed is in [~~brackets with line through.~~]

Text to be adopted/added is in **bold and underscored.**

~~[437-002-0321-*General. No employer shall require or permit any employee to enter or to perform any function in proximity to high voltage lines, unless danger from accidental contact with said high voltage lines has been effectively guarded against.*]~~

~~[Stat. Auth.: ORS 654.025(2) and 656.726(3).]
[Hist.: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90].
[OR-OSHA Admin. Order 2-1991, f. 2/4/91, ef. 4/1/91].]~~

~~[437-002-0322-*Clearance or Safeguards Required.*]~~

~~[(1) *The operation, erection, or transportation of any tools, equipment, or any part thereof capable of movement; the handling, transportation, or storage of any materials; or the moving of any building, near high voltage lines, is prohibited, if at any time it is possible to bring such object within 10 feet of high voltage lines.*]~~

~~[(2) *For equipment in transit, on smooth surfaces, the clearance shall be a minimum of 4 feet for voltages less than 50 kV., 10 feet for voltages over 50 kV., up to and including 345 kV., and 16 feet for voltages up to and including 750 kV.*]~~

~~[(3) *A person shall be designated to observe clearance and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.*]~~

~~[(4) *The 10-foot requirement shall not be reduced by movement due to any strains impressed upon the structures supporting the high voltage line and upon any equipment, fixtures, or attachments thereon.*]~~

~~[Stat. Auth.: ORS 654.025(2) and 656.726(3).]
[Hist.: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90].
[OR-OSHA Admin. Order 2-1991, f. 2/4/91, ef. 4/1/91].]~~

~~[437-002-0323 Warning Signs Required. The employer shall post and maintain in plain view of the operator on each crane, derrick, power shovel, drilling rig, hay loader, hay stacker, pile driver, or similar apparatus, any part of which is capable of vertical, lateral, or swinging motion, a durable warning sign legible at 12 feet reading “Unlawful to operate this equipment within 10 feet of high-voltage lines.”]~~

[Stat. Auth.: ORS 654.025(2) and 656.726(3).]
[Hist.: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.]
[OR-OSHA Admin. Order 2-1991, f. 2/4/91, ef. 4/1/91.]

~~[437-002-0324 Notification to Power Company and Responsibility for Safeguards.]~~

~~[(1) When any operations are to be performed, tools or materials handled, equipment is to be moved or operated within 10 feet of any high-voltage line, the person or persons responsible for the work to be done shall promptly notify the operator of the high-voltage line of the work to be performed, and shall be responsible for the completion of the safety measures as required before proceeding with any work which would impair the aforesaid clearance.]~~

~~[(2) This section when applied to railway systems, shall be construed as permitting operation of standard rail equipment, which is normally used in the transportation of freight and/or passengers, and the operation of relief trains, or other equipment in emergencies, at a distance of less than 10 feet from any high-voltage conductor; but shall be construed as prohibiting normal repair or construction operations at a distance of less than 10 feet from any high-voltage conductor by other than properly qualified and authorized persons or employees under the direct supervision of any authorized person who is familiar with the hazards involved, until the safety provisions of the foregoing sections have been complied with.]~~

[Stat. Auth.: ORS 654.025(2) and 656.726(3).]
[Hist.: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.]
[OR-OSHA Admin. Order 2-1991, f. 2/4/91, ef. 4/1/91.]

~~[437-002-0325 Underground Installations. In addition to and not in lieu of any rules relating to “underground installations” adopted in Oregon Administrative Rules, Chapter 437, the following Oregon Revised Statutes and Oregon Administrative Rules administered by the Oregon Public Utility Commission (PUC) shall apply:]~~

~~[(1) ORS 757.541 through 757.571; and]~~

~~[(2) OAR 860-24-006 and OAR 860-24-007.]~~

[Stat. Auth.: ORS 654.025(2) and 656.726(3).]
[Hist.: OR-OSHA Admin. Order 8-1990, f. 3/30/90, ef. 3/30/90.]
[OR-OSHA Admin. Order 2-1991, f. 2/4/91, ef. 4/1/91.]

NOTE: Use the national telephone number 811 or 1-800-332-2344 for Call Before You Dig before any digging or excavation.

437-002-0047 Working Near Overhead High Voltage Lines and Equipment.

(1) Definitions.

Insulating Barrier or Guard. A structure, installation, barrier, or guard (such as a wall, fence, pole, shield, or something similar) that stops movement and prevents all possible contact with the lines or equipment. Its design, material composition, and installation prevents possible conduction of electricity up to the maximum voltage of the system.

Restricted Space.

(a) For lines rated more than 600 V to 50 kV, restricted space extends 10 feet in all directions from the surface of the line or equipment.

(b) For lines rated over 50 kV, restricted space extends 10 feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the insulator (but never less than 10 feet) in all directions from the surface of the line or equipment.

(c) For equipment or structures in transit, on level surfaces, restricted space extends 4 feet in all directions from lines or equipment rated 50 kV or less, 10 feet in all directions for lines or equipment rated over 50 kV, and 16 feet in all directions for lines or equipment rated over 345 kV up to and including 750 kV.

Proper Notification. The person(s) responsible for the (planned) activity must notify the owner/operator of the line or equipment, at their business office, at least 2 business days prior to the anticipated beginning of work (business days are Monday through Friday, excluding federal and state holidays). The notification must include: (1) the proposed date to start activity within restricted space; (2) the location of the planned activity; (3) a description of the planned activity; and (4) name and contact information of the contact person.

(2) General requirement. Do not enter, perform any function or activity (such as handling, erecting, operating, transporting, or storing any tools, equipment or materials, moving a building or structure) within the restricted space surrounding an overhead high voltage line or equipment unless:

(a) Proper notification is provided; and

(A) The line and/or equipment is de-energized and visibly grounded by the owner of the high voltage system or their authorized agent; or

(B) Accidental contact is effectively prevented by use of insulating barriers or guards. Barriers or guards must:

(i) Be erected or installed by the owner of the high voltage system or their authorized agent;

(ii) Not be attached to, or be part of the lines, equipment, or machinery;

Note: Overhead line covers are only for visual reference, and their use does not allow entry into restricted space. If used, they must be installed by the owner of the high voltage system or their authorized agent.

(iii) Prevent all possible contact with the lines or equipment; and

(iv) Insulate against the system's maximum voltage; or

(b) You are the owner, an authorized employee, or authorized (in writing) agent of the overhead high voltage system: or

(c) Insulated lines (not tree wire) and equipment (designed and engineered to allow only incidental contact) are erected or installed by the owner of the high voltage system or their authorized agent.

Note: Nothing in this standard shifts the responsibility for safe and healthy working conditions from the person(s) responsible for the activity to the owner of the lines or their agent.

Note: Nothing in this standard mandates that the owner of the lines or equipment, or their authorized agent must agree to de-energize, move, barricade, guard, or insulate lines or equipment, or take other action to allow entry into restricted space.

(3) Do not move, reposition, or reduce restricted space in any direction by applying stress or force to a line, equipment, or supporting structure.

(4) Operation of machinery or equipment.

(a) Do not enter restricted space when using insulating links or proximity warning devices on equipment.

(b) Post a warning sign on each piece of equipment which is capable of vertical, lateral, or swinging motion, such as a crane, derrick, power shovel, drilling rig, or pile driver.

(A) The sign must be made of durable material.

(B) It must be in clear view of the operator.

(C) The message must be legible to the operator when at the controls.

(D) The message must be understood by the operator.

(E) The message must clearly convey that it is “Unlawful to operate the piece of equipment within 10 feet of high voltage lines”.

(c) Use an observer to provide audible warning (able to be clearly heard over surrounding noise) when it becomes difficult for an operator to identify restricted space by using visual means. The observer’s only task is to watch the clearance and warn the operator if it appears that restricted space will be breached.

(d) Restrict, barricade, or otherwise make it impossible for a machine or piece of equipment to reach into restricted space if it is reasonable to anticipate that the operator’s attention may be focused on the work process rather than the location of an overhead high voltage line or equipment (such as during excavating, or other fast-paced, repetitive work).

(5) Railway and commuter systems

(a) Standard rail equipment used to transport freight and/or passengers, and relief trains or other equipment used in emergencies, may enter restricted space surrounding high voltage lines or equipment.

(b) Qualified employees, authorized and supervised by a person familiar with the hazards of the railway high voltage system, may perform normal repair or construction work within restricted space prior to compliance with the clearance and safeguard requirements in sections (1) through (4).

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

§1910.333 Selection and Use of Work Practices.

(a) General. Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

(1) Deenergized parts. Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the employer can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Note 1: Examples of increased or additional hazards include interruption of life support equipment, deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.

Note 2: Examples of work that may be performed on or near energized circuit parts because of infeasibility due to equipment design or operational limitations include testing or electric circuits that can only be performed with the circuit energized and work on circuits that form an integral part of a continuous industrial process in a chemical plant that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.

Note 3: Work on or near deenergized parts is covered by paragraph (b) of this section.

(2) Energized parts. If the exposed live parts are not deenergized (i.e., for reasons of increased or additional hazards or infeasibility), other safety-related work practices shall be used to protect employees who may be exposed to the electrical hazards involved. Such work practices shall protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts. Specific work practice requirements are detailed in paragraph (c) of this section.

(b) Working on or near exposed deenergized parts.

(1) Application. This paragraph applies to work on exposed deenergized parts or near enough to them to expose the employee to any electrical hazard they present. Conductors and parts of electric equipment that have been deenergized but have not been locked out or tagged in accordance with paragraph (b) of this section shall be treated as energized parts, and paragraph (c) of this section applies to work on or near them.

(2) Lockout and tagging. While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both in accordance with the requirements of this paragraph. The requirements shall be followed in the order in which they are presented (i.e., paragraph (b)(2)(i) first, then paragraph (b)(2)(ii), etc.).

Note 1: As used in this section, fixed equipment refers to equipment fastened in place or connected by permanent wiring methods.

Note 2: Lockout and tagging procedures that comply with paragraphs (c) through (f) of §1910.147 will also be deemed to comply with paragraph (b)(2) of this section provided that:

- (1) The procedures address the electrical safety hazards covered by this Subpart; and
- (2) The procedures also incorporate the requirements of paragraphs (b)(2)(iii)(D) and (b)(2)(iv)(B) of this section.
 - (i) Procedures. The employer shall maintain a written copy of the procedures outlined in paragraph (b)(2) and shall make it available for inspection by employees and by the Assistant Secretary of Labor and his or her authorized representatives.

Note: The written procedures may be in the form of a copy of paragraph (b) of this section.

(ii) Deenergizing equipment.

(A) Safe procedures for deenergizing circuits and equipment shall be determined before circuits or equipment are deenergized.

(B) The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.

(C) Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

(D) Stored non-electrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

(iii) Application of locks and tags.

(A) A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in paragraphs (b)(2)(iii)(C) and (b)(2)(iii)(E) of this section. The lock shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

(B) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(C) If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(D) A tag used without a lock, as permitted by paragraph (b)(2)(iii)(C) of this section, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(E) A lock may be placed without a tag only under the following conditions:

- (1) Only one circuit or piece of equipment is deenergized, and
- (2) The lockout period does not extend beyond the work shift, and
- (3) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

(iv) Verification of deenergized condition. The requirements of this paragraph shall be met before any circuits or equipment can be considered and worked as deenergized.

(A) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(B) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

(v) Reenergizing equipment. These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(A) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.

(B) Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

(C) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task provided that:

- (1) The employer ensures that the employee who applied the lock or tag is not available at the workplace, and
- (2) The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.

(D) There shall be a visual determination that all employees are clear of the circuits and equipment.

(c) Working on or near exposed energized parts.

(1) Application. This paragraph applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

(2) Work on energized equipment. Only qualified persons may work on electric circuit parts or equipment that have not been deenergized under the procedures of paragraph (b) of this section. Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

NOTE: 1910.333(c)(3) introductory text and (c)(3)(i) are repealed in Oregon. In Oregon OAR 437-002-0047 applies.

~~(3) Overhead lines. [If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.]~~

Note: The work practices used by qualified persons installing insulating devices on overhead power transmission or distribution lines are covered by §1910.269 of this Part, not by §§1910.332 through 1910.335 of this Part. Under paragraph (c)(2) of this section, unqualified persons are prohibited from performing this type of work.

~~[(i) Unqualified persons.]~~

~~[(A) When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:]~~

~~[(1) For voltages to ground 50 kV or below — 10 feet (305 cm);]~~

~~[(2) For voltages to ground over 50 kV — 10 feet (305 cm) plus 4 inches (10 cm) for every 10 kV over 50 kV.]~~

~~[(B) When an unqualified person is working on the ground in the vicinity of overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given in paragraph (c)(3)(i)(A) of this section.]~~

~~[Note: For voltages normally encountered with overhead power lines, objects which do not have an insulating rating for the voltage involved are considered to be conductive.]~~

(ii) Qualified persons. When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table S-5.

NOTE: §1910.333(c)(3)(ii)(A) through (C) were not adopted in Oregon, due to conflict with existing Oregon-initiated Rules.

TABLE S-5. – Approach Distances for Qualified Employees - Alternating Current

Voltage range (phase to phase)	Minimum approach distance
300 V and less.....	Avoid contact.
Over 300 V, not over 750 V.....	1 foot 0 inch (30.5 cm).
Over 750 V, not over 2 kV.....	1 foot 6 inches (46 cm).
Over 2 kV, not over 15 kV.....	2 feet 0 inch (61 cm).
Over 15 kV, not over 37 kV.....	3 feet 0 inch (91 cm).
Over 37 kV, not over 87.5 kV.....	3 feet 6 inches (107 cm).
Over 87.5 kV, not over 121 kV.....	4 feet 0 inch (122 cm).
Over 121 kV, not over 140 kV.....	4 feet 6 inches (137 cm).

(iii) Vehicular and mechanical equipment.

(A) Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 feet (305 cm) is maintained. If the voltage is higher than 50 kV, the clearance shall be increased 4 inches (10 cm) for every 10 kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

(1) If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 feet (122 cm). If the voltage is higher than 50 kV, the clearance shall be increased 4 inches (10 cm) for every 10 kV over that voltage.

(2) If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

(3) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in Table S-5.

(B) Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:

(1) The employee is using protective equipment rated for the voltage; or

(2) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in paragraph (c)(3)(iii) of this section.

(C) If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional

precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

(4) Illumination.

(i) Employees may not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

(ii) Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts. Employees may not reach blindly into areas which may contain energized parts.

(5) Confined or enclosed work spaces. When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

(6) Conductive materials and equipment. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, the employer shall institute work practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

(7) Portable ladders. Portable ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

(8) Conductive apparel. Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) may not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

(9) Housekeeping duties. Where live parts present an electrical contact hazard, employees may not perform housekeeping duties as such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided. Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

(10) Interlocks. Only a qualified person following the requirements of paragraph (c) of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.