

covers integrated electrical systems, other than unit equipment, in which orderly shutdown is necessary to ensure safe operation. An integrated electrical system as used in this section shall be a unitized segment of an industrial wiring system where all of the following conditions are met:

- (i) An orderly shutdown process minimizes employee hazard and equipment damage;
- (ii) The conditions of maintenance and supervision ensure that only qualified persons will service the system; and
- (iii) Effective safeguards are established and maintained.

(2) *Location of overcurrent devices in or on premises.* Overcurrent devices that are critical to integrated electrical systems need not be readily accessible to employees as required by §1910.304(f)(1)(iv) if they are located with mounting heights to ensure security from operation by nonqualified persons.

§§ 1910.309–1910.330 [Reserved]

SAFETY-RELATED WORK PRACTICES

§ 1910.331 Scope.

(a) *Covered work by both qualified and unqualified persons.* The provisions of §§1910.331 through 1910.335 cover electrical safety-related work practices for both qualified persons (those who have training in avoiding the electrical hazards of working on or near exposed energized parts) and unqualified persons (those with little or no such training) working on, near, or with the following installations:

- (1) *Premises wiring.* Installations of electric conductors and equipment within or on buildings or other structures, and on other premises such as yards, carnival, parking, and other lots, and industrial substations;
- (2) *Wiring for connection to supply.* Installations of conductors that connect to the supply of electricity; and
- (3) *Other wiring.* Installations of other outside conductors on the premises.
- (4) *Optical fiber cable.* Installations of optical fiber cable where such installations are made along with electric conductors.

NOTE: See §1910.399 for the definition of “qualified person.” See §1910.332 for training requirements that apply to qualified and unqualified persons.

(b) *Other covered work.* The provisions of §§1910.331 through 1910.335 also cover:

- (1) Work performed by unqualified persons on, near, or with the installations listed in paragraphs (c)(1) through (4) of this section; and
- (2) Work performed by qualified persons near the installations listed in paragraphs (c)(1) through (c)(4) of this section when that work is not on or directly associated with those installations.

(c) *Excluded work by qualified persons.* The provisions of §§1910.331 through 1910.335 do not apply to work performed by qualified persons on or directly associated with the following installations:

- (1) *Generation, transmission, and distribution installations.* Installations for the generation, control, transformation, transmission, and distribution of electric energy (including communication and metering) located in buildings used for such purposes or located outdoors.

NOTE 1 TO PARAGRAPH (c)(1): Work on or directly associated with installations of utilization equipment used for purposes other than generating, transmitting, or distributing electric energy (such as installations which are in office buildings, warehouses, garages, machine shops, or recreational buildings, or other utilization installations which are not an integral part of a generating installation, substation, or control center) is covered under paragraph (a)(1) of this section.

NOTE 2 TO PARAGRAPH (c)(1): For work on or directly associated with utilization installations, an employer who complies with the work practices of §1910.269 (electric power generation, transmission, and distribution) will be deemed to be in compliance with §§1910.333(c) and 1910.335. However, the requirements of §§1910.332, 1910.333(a), 1910.333(b), and 1910.334 apply to *all* work on or directly associated with utilization installations, regardless of whether the work is performed by qualified or unqualified persons.

NOTE 3 TO PARAGRAPH (c)(1): Work on or directly associated with generation, transmission, or distribution installations includes:

- (1) Work performed directly on such installations, such as repairing overhead or underground distribution lines or repairing a feed-

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water pump for the boiler in a generating plant.

(2) Work directly associated with such installations, such as line-clearance tree trimming and replacing utility poles, when that work is covered by §1910.269 (see §1910.269(a)(1)(i)(D) and (E) and the definition of "line-clearance tree trimming" in §1910.269(x)).

(3) Work on electric utilization circuits in a generating plant provided that:

(A) Such circuits are commingled with installations of power generation equipment or circuits, and

(B) The generation equipment or circuits present greater electrical hazards than those posed by the utilization equipment or circuits (such as exposure to higher voltages or lack of overcurrent protection).

This work is covered by §1910.269.

(2) *Communications installations.* Installations of communication equipment to the extent that the work is covered under §1910.268.

(3) *Installations in vehicles.* Installations in ships, watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles.

(4) *Railway installations.* Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations of railways used exclusively for signaling and communication purposes.

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§ 1910.332 Training.

(a) *Scope.* The training requirements contained in this section apply to employees who face a risk of electric shock that is not reduced to a safe level by the electrical installation requirements of §§1910.303 through 1910.308.

NOTE: Employees in occupations listed in Table S-4 face such a risk and are required to be trained. Other employees who also may

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reasonably be expected to face a comparable risk of injury due to electric shock or other electrical hazards must also be trained.

(b) *Content of training*—(1) *Practices addressed in this standard.* Employees shall be trained in and familiar with the safety-related work practices required by §§1910.331 through 1910.335 that pertain to their respective job assignments.

(2) *Additional requirements for unqualified persons.* Employees who are covered by paragraph (a) of this section but who are not qualified persons shall also be trained in and familiar with any electrically related safety practices not specifically addressed by §§1910.331 through 1910.335 but which are necessary for their safety.

(3) *Additional requirements for qualified persons.* Qualified persons (i.e., those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in and familiar with the following:

(i) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment,

(ii) The skills and techniques necessary to determine the nominal voltage of exposed live parts, and

(iii) The clearance distances specified in §1910.333(c) and the corresponding voltages to which the qualified person will be exposed.

NOTE 1: For the purposes of §§1910.331 through 1910.335, a person must have the training required by paragraph (b)(3) of this section in order to be considered a qualified person.

NOTE 2: Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials must also have the training needed to meet §1910.333(c)(2).

(c) *Type of training.* The training required by this section shall be of the classroom or on-the-job type. The degree of training provided shall be determined by the risk to the employee.