

(z) *Water gels, or slurry explosives*—A wide variety of materials used for blasting. They all contain substantial proportions of water and high proportions of ammonium nitrate, some of which is in solution in the water. Two broad classes of water gels are: (1) Those which are sensitized by a material classed as an explosive, such as TNT or smokeless powder, and (2) those which contain no ingredient classified as an explosive; these are sensitized with metals such as aluminum or with other fuels. Water gels may be premixed at an explosives plant or mixed at the site immediately before delivery into the bore hole.

(aa) *Semiconductive hose*. Semiconductive hose—a hose with an electrical resistance high enough to limit flow of stray electric currents to safe levels, yet not so high as to prevent drainage of static electric charges to ground; hose of not more than 2 megohms resistance over its entire length and of not less than 5,000 ohms per foot meets the requirement.

[44 FR 8577, Feb. 9, 1979; 44 FR 20940, Apr. 6, 1979, as amended at 58 FR 35184 and 35311, June 30, 1993]

Subpart V—Power Transmission and Distribution

AUTHORITY: Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), 9-83 (48 FR 35736), or 1-90 (55 FR 9033), as applicable. Section 1926.951 also issued under 29 CFR Part 1911.

§ 1926.950 General requirements.

(a) *Application*. The occupational safety and health standards contained in this subpart V shall apply to the construction of electric transmission and distribution lines and equipment.

(1) As used in this subpart V the term "construction" includes the erection of new electric transmission and distribution lines and equipment, and the alteration, conversion, and improvement of existing electric transmission and distribution lines and equipment.

(2) Existing electric transmission and distribution lines and electrical equip-

ment need not be modified to conform to the requirements of applicable standards in this subpart V, until such work as described in paragraph (a)(1) of this section is to be performed on such lines or equipment.

(3) The standards set forth in this subpart V provide minimum requirements for safety and health. Employers may require adherence to additional standards which are not in conflict with the standards contained in this subpart V.

(b) *Initial inspections, tests, or determinations*. (1) Existing conditions shall be determined before starting work, by an inspection or a test. Such conditions shall include, but not be limited to, energized lines and equipment, conditions of poles, and the location of circuits and equipment, including power and communication lines, CATV and fire alarm circuits.

(2) Electric equipment and lines shall be considered energized until determined to be deenergized by tests or other appropriate methods or means.

(3) Operating voltage of equipment and lines shall be determined before working on or near energized parts.

(c) *Clearances*. The provisions of paragraph (c) (1) or (2) of this section shall be observed.

(1) No employee shall be permitted to approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table V-1, unless:

(i) The employee is insulated or guarded from the energized part (gloves or gloves with sleeves rated for the voltage involved shall be considered insulation of the employee from the energized part), or

(ii) The energized part is insulated or guarded from him and any other conductive object at a different potential, or

(iii) The employee is isolated, insulated, or guarded from any other conductive object(s), as during live-line bare-hand work.

(2) (i) The minimum working distance and minimum clear hot stick distances stated in Table V-1 shall not be violated. The minimum clear hot stick distance is that for the use of live-line tools held by linemen when performing live-line work.

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(ii) Conductor support tools, such as link sticks, strain carriers, and insulator cradles, may be used: *Provided*, That the clear insulation is at least as long as the insulator string or the minimum distance specified in Table V-1 for the operating voltage.

TABLE V-1—ALTERNATING CURRENT—MINIMUM DISTANCES

Voltage range (phase to phase) kilovolt	Minimum working and clear hot stick distance
2.1 to 15	2 ft. 0 in.
15.1 to 35	2 ft. 4 in.
35.1 to 46	2 ft. 6 in.
46.1 to 72.5	3 ft. 0 in.
72.6 to 121	3 ft. 4 in.
138 to 145	3 ft. 6 in.
161 to 169	3 ft. 8 in.
230 to 242	5 ft. 0 in.
345 to 362	¹ 7 ft. 0 in.
500 to 552	¹ 11 ft. 0 in.
700 to 765	¹ 15 ft. 0 in.

¹NOTE: For 345-362 kv., 500-552 kv., and 700-765 kv., the minimum working distance and the minimum clear hot stick distance may be reduced provided that such distances are not less than the shortest distance between the energized part and a grounded surface.

(d) *Deenergizing lines and equipment.*
 (1) When deenergizing lines and equipment operated in excess of 600 volts, and the means of disconnecting from electric energy is not visibly open or visibly locked out, the provisions of paragraphs (d)(1) (i) through (vii) of this section shall be complied with:

(i) The particular section of line or equipment to be deenergized shall be clearly identified, and it shall be isolated from all sources of voltage.

(ii) Notification and assurance from the designated employee shall be obtained that:

(a) All switches and disconnectors through which electric energy may be supplied to the particular section of line or equipment to be worked have been deenergized;

(b) All switches and disconnectors are plainly tagged indicating that men are at work;

(c) And that where design of such switches and disconnectors permits, they have been rendered inoperable.

(iii) After all designated switches and disconnectors have been opened, rendered inoperable, and tagged, visual inspection or tests shall be conducted to

insure that equipment or lines have been deenergized.

(iv) Protective grounds shall be applied on the disconnected lines or equipment to be worked on.

(v) Guards or barriers shall be erected as necessary to adjacent energized lines.

(vi) When more than one independent crew requires the same line or equipment to be deenergized, a prominent tag for each such independent crew shall be placed on the line or equipment by the designated employee in charge.

(vii) Upon completion of work on deenergized lines or equipment, each designated employee in charge shall determine that all employees in his crew are clear, that protective grounds installed by his crew have been removed, and he shall report to the designated authority that all tags protecting his crew may be removed.

(2) When a crew working on a line or equipment can clearly see that the means of disconnecting from electric energy are visibly open or visibly locked-out, the provisions of paragraphs (d)(i), and (ii) of this section shall apply:

(i) Guards or barriers shall be erected as necessary to adjacent energized lines.

(ii) Upon completion of work on deenergized lines or equipment, each designated employee in charge shall determine that all employees in his crew are clear, that protective grounds installed by his crew have been removed, and he shall report to the designated authority that all tags protecting his crew may be removed.

(e) *Emergency procedures and first aid.*

(1) The employer shall provide training or require that his employees are knowledgeable and proficient in:

(i) Procedures involving emergency situations, and

(ii) First-aid fundamentals including resuscitation.

(2) In lieu of paragraph (e)(1) of this section the employer may comply with the provisions of §1926.50(c) regarding first-aid requirements.

(f) *Night work.* When working at night, spotlights or portable lights for emergency lighting shall be provided as needed to perform the work safely.

(g) *Work near and over water.* When crews are engaged in work over or near water and when danger of drowning exists, suitable protection shall be provided as stated in § 1926.104, or § 1926.105, or § 1926.106.

(h) *Sanitation facilities.* The requirements of § 1926.51 of subpart D of this part shall be complied with for sanitation facilities.

(i) *Hydraulic fluids.* All hydraulic fluids used for the insulated sections of derrick trucks, aerial lifts, and hydraulic tools which are used on or around energized lines and equipment shall be of the insulating type. The requirements for fire resistant fluids of § 1926.302(d)(1) do not apply to hydraulic tools covered by this paragraph.

§ 1926.951 Tools and protective equipment.

(a) *Protective equipment.* (1)(i) Rubber protective equipment shall be in accordance with the provisions of the American National Standards Institute (ANSI), ANSI J6 series, as follows:

Item	Standard
Rubber insulating gloves	J6.6-1971.
Rubber matting for use around electric apparatus	J6.7-1935 (R1971).
Rubber insulating blankets	J6.4-1971.
Rubber insulating hoods	J6.2-1950 (R1971).
Rubber insulating line hose	J6.1-1950 (R1971).
Rubber insulating sleeves	J6.5-1971.

(ii) Rubber protective equipment shall be visually inspected prior to use.

(iii) In addition, an "air" test shall be performed for rubber gloves prior to use.

(iv) Protective equipment of material other than rubber shall provide equal or better electrical and mechanical protection.

(2) Protective hats shall be in accordance with the provisions of ANSI Z89.2-1971 Industrial Protective Helmets for Electrical Workers, Class B, and shall be worn at the jobsite by employees who are exposed to the hazards of falling objects, electric shock, or burns.

(b) *Personal climbing equipment.* (1) Body belts with straps or lanyards shall be worn to protect employees working at elevated locations on poles, towers, or other structures except where such use creates a greater hazard to the safety of the employees, in

which case other safeguards shall be employed.

(2) Body belts and safety straps shall meet the requirements of § 1926.959. In addition to being used as an employee safeguarding item, body belts with approved tool loops may be used for the purpose of holding tools. Body belts shall be free from additional metal hooks and tool loops other than those permitted in § 1926.959.

(3) Body belts and straps shall be inspected before use each day to determine that they are in safe working condition.

(4)(i) Lifelines and lanyards shall comply with the provisions of § 1926.502.

(ii) Safety lines are not intended to be subjected to shock loading and are used for emergency rescue such as lowering a man to the ground. Such safety lines shall be a minimum of one-half-inch diameter and three or four strand first-grade manila or its equivalent in strength (2,650 lb.) and durability.

(5) Defective ropes shall be replaced.

(c) *Ladders.* (1) Portable metal or conductive ladders shall not be used near energized lines or equipment except as may be necessary in specialized work such as in high voltage substations where nonconductive ladders might present a greater hazard than conductive ladders. Conductive or metal ladders shall be prominently marked as conductive and all necessary precautions shall be taken when used in specialized work.

(2) Hook or other type ladders used in structures shall be positively secured to prevent the ladder from being accidentally displaced.

(d) *Live-line tools.* (1) Only live-line tool poles having a manufacturer's certification to withstand the following minimum tests shall be used:

(i) 100,000 volts per foot of length for 5 minutes when the tool is made of fiberglass; or

(ii) 75,000 volts per foot of length for 3 minutes when the tool is made of wood; or

(iii) Other tests equivalent to paragraph (d) (i) or (ii) of this section as appropriate.

(2) All live-line tools shall be visually inspected before use each day. Tools to be used shall be wiped clean and if any