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Title 29—Labor

CHAPTER XVII—OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LABOR

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Telecommunications; Vehicle-Mounted Elevating and Rotating Platforms; and Helicopters

Pursuant to sections 6(b) and 8(c) of the Occupational Safety and Health Act of 1970 (84 Stat. 1593, 1599; 29 U.S.C. 655, 657), Secretary of Labor's Order No. 12-71 (36 FR 8754) and 29 CFR Part 1911, Part 1910 of Title 29, Code of Federal Regulations, is hereby amended by revising §§ 1910.67 and 1910.70, by redesignating §§ 1910.183 and 1910.184 as §§ 1910.189 and 1910.190 respectively; by redesignating §§ 1910.268 and 1910.269 as §§ 1910.274 and 1910.275 respectively, by adding new §§ 1910.183 and 1910.268, and by revising new § 1910.275 in the manner set forth below. These amendments provide special requirements for work performed in the telecommunications industry, and in addition provide safety requirements for helicopters and vehicle-mounted elevating and rotating platforms when used in general industry.

I. Background. On August 28, 1973, a notice of proposed rulemaking was published in the FEDERAL REGISTER (38 FR 23038) which contained proposed occupational safety and health standards relating to work involved in providing telecommunications services. The proposed regulations were based substantially upon the recommendations of a voluntary committee consisting of representatives from telephone companies, communications unions and other affected groups. In addition to regulations for telecommunications, it was also proposed to apply to all industries certain construction safety standards contained in 29 CFR Part 1926 relating to the use of helicopters and vehicle-mounted elevating and rotating platforms, since the use of this equipment is quite extensive in telecommunications work and other operations which do not involve construction work.

The notice of proposed rulemaking invited interested persons to submit written data, views and arguments concerning the proposal, and set a hearing which was held on October 24, 1973, in order to receive oral presentations and additional related information. Nine persons testified at the hearing and 33 exhibits were received into evidence. At the hearing, time was allowed for interested persons to make submissions for an additional period of 45 days. The presiding administrative law judge certified the record of the proceedings on or about January 14, 1974.

The written comments received in response to the notice of proposed rulemaking, the testimony and exhibits received at the hearing, and the post-hearing comments have been reviewed carefully and constitute the record upon which the decision in this case has been based. The major issues raised in the comments and at the hearing are discussed below.

II. Discussion of major issues.—A. Vehicle-mounted elevating and rotating platforms. Vehicle-mounted elevating and rotating platforms (aerial devices) are widely used in many industries, as well as in construction work. However, the standards regulating their use in 29 CFR 1926 are considerably more comprehensive than their counterparts in 29 CFR Part 1910. Therefore, it was proposed to amend § 1910.67 in order to include the more comprehensive requirements of § 1926.556, which provide greater protection to employees. Most of the comments which addressed this proposed amendment favored the inclusion of the new requirements. However, some commenters raised issues with various individual requirements, as discussed separately below.

1. Ten-foot clearance rule. Section 1910.67(b)(4) of the proposal provided, in part, that where aerial lifts were operated near energized electric power lines, a minimum clearance of ten feet between the aerial device and the lines was to be maintained.

The reason for this requirement is to protect employees who lack familiarity with and training in hazards associated with working near electric power lines. A similar clearance rule can be found in § 1910.180(j) dealing with the operation of crawler locomotive, and truck cranes near electric lines and in § 1926.550(a)(15) for cranes and derricks.

Several commenters interpreted this proposed requirement to apply to all persons operating aerial lifts near power lines. (Comment Nos. 30, 46, 58; the comment numbers refer to the official listing of comments, which list is part of the record.) However, this was not the intent of the proposed standard. Telecommunications workers, electric utility workers and line-clearance tree trimmers, because of their training and experience, are familiar with the hazards and techniques associated with working on or near energized lines, and it is often necessary for these types of employees to work closer than ten feet to the lines. Therefore, the final rule provides an exception from the ten foot clearance requirement in § 1910.67 for telecommunications, electric utility, and line-clearance tree trimming operations (§ 1910.67(b)(4)(i)(C)) to clearly reflect the intent of the proposal. And, as proposed, separate clearance distances have been established for these employees in Tables R-2 (telecommunications workers) and R-3 (line-clearance tree trimmers) of the new § 1910.268. Clearance distances for electric utility workers are found in Tables V-1 and V-2 of Subpart V of Part 1926. These special requirements take into account the training and experience of the employees, and the nature of the work being performed.

2. Ladder trucks and tower trucks. Proposed § 1910.67(c)(1) prescribed the means by which ladders were to be secured to trucks before such trucks were moved for highway travel. The standard would have required, in part, that the ladder be secured at the base by a manually operated device.

One commenter claimed that manually operated devices are not the only effective means of securing the ladder at the base, and that the standard as proposed would inhibit technology (Comment No. 21). It was recommended that other proven effective means of securing ladders, such as cradles in combination with hydraulic cylinders or screw actuators, also be permitted. Since the requirement in the proposal for a manually operated device was not intended to exclude the use of other devices which would be equally safe, the recommendation has been accepted, and the final rule requires ladders to be secured at the base by a manually operated device or by other equally effective means.

3. Platform controls. Several comments were received concerning the scope of the proposed requirement set forth in § 1910.67(c)(2)(ix) which requires upper and lower controls for extensible and articulating boom platforms which are primarily designed as personnel carriers (Comment Nos. 35, 81, and Hearing Exhibit #31). The commenters were concerned whether derrick trucks or other lifting equipment which are not primarily designed as personnel carriers, but to which personnel platforms may occasionally be attached, would be required to have upper controls when the equipment is used for lifting or carrying personnel. The proposed standard, as well as § 1926.556(b)(2)(ix), were intended to apply only to articulating boom and extensible boom platforms primarily designed as personnel carriers. The final standard, which is the same as the proposal in this regard, clearly limits application of the requirement to such boom platforms when they are primarily designed as personnel carriers. Accordingly, equipment which is designed primarily for purposes other than lifting personnel is not required to have upper controls, and does not fall within the scope of § 1910.67(c)(2)(ix).

B. Helicopters. Section 1910.183 was proposed (as § 1910.185) for inclusion in Part 1910, because there are many applications for helicopter use in general industries, such as aerial photography and survey, firefighting, rescue operations, transportation of personnel to elevated jobsites, and delivery of emergency supplies. The requirements contained in the proposal were the same as the requirements presently contained in § 1926.551 of the construction standards.

Application of the same requirements to general industry will provide similar protection to non-construction employees. There was no significant opposition to this proposed section and no issues were raised regarding it. Accordingly, the standard on helicopters is adopted in § 1910.183 as proposed with minor modifications. Where the language of the final standard differs from the proposal or from § 1926.551, these differences are intended merely to clarify or make more explicit the employer's obligations which exist in the construction standard and which were encompassed within the proposal.

C. Telecommunications.—1. General. The proposed telecommunications standards dealt primarily with the practices,

methods, operations, installations and processes involved in telecommunications work. These proposed regulations were contained in a separate Subpart T of Part 1910, since it was intended to develop standards which addressed the unique characteristics of the telecommunications industry. With respect to the uniqueness of the telecommunication standards, several commenters suggested that the proposed requirements were applicable to industries other than telecommunications, while other commenters indicated that the regulations already contained in Parts 1910 and 1926 adequately addressed the safety hazards associated with telecommunications work.

It has been decided to place the regulations setting forth the unique safety requirements for the telecommunications industry in § 1910.268, which is within Subpart R of Part 1910—Special Industries. This section contains standards which are addressed to the special hazards and special circumstances which exist in the telecommunications industry. However, this section only encompasses those standards which we believe to be unique to telecommunications, and does not contain all the standards which may apply to telecommunications operations. Thus, as provided in § 1910.268(a)(3), and consistent with § 1910.5(c)(2), any standard in Part 1910 applies to the telecommunications industry, to the extent that none of the provisions in § 1910.268 apply. For example, the general standards regarding noise exposure in § 1910.95 applies to telecommunications operations. Several portions of the proposal which merely referenced specific applicable Part 1910 standards, such as proposed § 1910.331(a)(1), have been deleted from the final rule so as to make it clear that all relevant Part 1910 standards apply to telecommunications, unless there are provisions covering the matter in § 1910.268. Where, however, § 1910.268 does contain standards which apply to unique employment conditions in telecommunications, they will prevail over any general standards in Part 1910.

Although most of these regulations are considered to be unique to the characteristics of the telecommunications industry, some may also have general applicability to other industries (e.g. tree-trimming). Those regulations which may have applicability to other industries are currently being studied. Where it appears that a standard has general applicability and therefore may be more appropriate in another subpart of Part 1910, rulemaking proceedings will be undertaken to propose the standard for inclusion in the appropriate general subpart and to remove it from the specialized industries subpart of Part 1910. Similarly, where it appears that standards contained in § 1910.268 are relevant for the construction industry, rulemaking proceedings will be undertaken to revise or amend the standards in Part 1926, where appropriate.

Several portions of the proposed telecommunications standard were the subject of controversy both in the written

comments and at the hearing. These issues, and the manner in which they were resolved, are discussed below.

2. *Existing equipment.* Several commenters requested that proposed § 1910.330(a) include an exemption from the telecommunications regulation for equipment and installations currently in existence. Others suggested that only new equipment, tools and facilities, and facilities substantially altered after the effective date of the standard be required to comply with the regulation. (Comment No. 32; Transcript pages 125, 126, 197.) While exemptions for existing equipment are appropriate in certain cases because of the practical difficulties of requiring retrofitting, a blanket exemption for all existing equipment is not warranted. Therefore, rather than grant a total exemption to all existing facilities and equipment, or require compliance for existing equipment and facilities only when there has been a substantial modification, it better fits the purposes of the Act to grant exemptions where it appears that retrofitting is impractical or impossible. Accordingly, when an exemption has been considered to be necessary and appropriate, it has been included with the particular requirement.

3. *Construction work.* Some commenters interpreted the requirements of the proposal to apply to construction work. However, this was not the intent, and the final rule, in § 1910.268(a)(2) and (a)(3) clearly states that § 1910.268 does not apply to operations involving construction work. Rather, the requirements of Part 1926 apply to all construction work in the telecommunications industry.

4. *Approach distances to exposed energized power conductors.* Table T-1, contained in § 1910.331(g) of the proposal, prescribed the minimum safety distances to be maintained by employees working near energized power conductors. Several commenters suggested that the requirement be clarified, since it could be interpreted to apply to telecommunications equipment, as well as electric power lines. (Comment Nos. 17, 34, 44.) This table was intended to apply only to overhead electric utility power lines and equipment, and not to telecommunication lines. In order to clarify this intent, the final rule as contained in § 1910.268(b)(7), and the title of the relevant table, now Table R-2, have been changed to clearly indicate that the requirement applies only to overhead power lines and parts, and not to telecommunication lines and equipment. In addition, the requirement in proposed § 1910.331(h) for special protection where employees work closer than 6' from energized power lines has been deleted from the final standard, since equivalent protection is provided in other portions of the standards.

5. *Training program.* The proposed § 1910.332 provided that employees must receive training pursuant to an established written program before being permitted to engage in telecommunications-related activities. Numerous commenters objected to the proposed

requirement because they interpreted it to preclude on-the-job, demonstration-type instruction as an acceptable form of training. (Comment Nos. 21, 41; Exhibit 33; Transcript page 200.) Others indicated that the proposal could be interpreted as requiring training as a prerequisite to employment. (Comment No. 52.) Some interpreted the requirement to mean that the only acceptable form of training would be where the subject matter was presented in a textbook-classroom form.

The intent of the proposed standard was to require a written description of the training program, rather than requiring employees to be trained exclusively by means of formal, written, textbook-classroom instruction. Accordingly, the final rule, in § 1910.268(c), expressly provides that either on-the-job training, classroom instruction, or both are acceptable forms of training. The final rule further clarifies the intent of the proposal by requiring such instruction to include apprising the employee of the necessary safety precautions and emergency procedures associated with telecommunications work. The employer is required to maintain a written description of the training program and of the types of employees to which such training applies. He is also required to maintain records of employees who have received such instruction.

6. *Personal protective equipment.* Section 1910.334 of the proposal provided that employees be required to use and inspect personal protective equipment, protective devices, and tools required for their work. Some commenters asserted that this provision placed the responsibility for inspection upon the employee rather than the employer. (Comment No. 52; Transcript pages 60, 61.) This was not the intent of the proposed standard, and the final rule contained in § 1910.268(e) clearly places this responsibility on the employer.

7. *Rubber insulating equipment.* Section 1910.335 of the proposal provided that rubber insulating equipment required for use in telecommunications work meet the requirements contained in ANSI J6.6-1971, "Standard Specifications for Rubber Insulating Gloves," and ANSI J6.4-1971 "Standard Specifications for Rubber Insulating Blankets," with the exception that a Modified Class I glove would be permitted in telecommunications operations. The proposal also set forth the electrical-test voltage requirements for the Modified Class I glove. Several persons objected to the use of the Modified Class I glove as proposed. Those commenters recommended that a Class I rubber glove, as defined in ANSI J6.b-1971, be required instead. (Comment No. 52.)

Testimony from those favoring the use of this Modified Class I glove indicates that these gloves are currently in widespread use in the telecommunications industry and that no electrical accidents have been attributed to their use. (Transcript pages 131, 174, 175.) In addition, no contrary data has been submitted to indicate that the proposed modified glove

is hazardous when used for telecommunications work.

The difference between the proposed Modified Class I glove and the ANSI J6.6-1971 Class I glove is shown by the following comparison:

	Minimum break-down voltage (root mean square)	Maximum proof-test current
Modified class I	17,000	16 mA
ANSI J6.6 class I	20,000	10 mA

ANSI is presently proposing a revision to its standard which would increase the maximum proof-test current to 14 mA for a Class I glove (Transcript pages 28, Comment No. 77).

In view of this proposed change in the ANSI standard, the final standard contained in § 1910.268(f) (1) requires that rubber gloves conform to the ANSI J6.6-1971 standard, with the exception that the Class I glove maximum proof-test current be not greater than 14 mA. In effect, these are the same requirements contained in the proposed ANSI standard. However, because of the extensive use of the modified glove, and in view of the evidence noted above, the final rule permits the use of existing Modified Class I gloves, provided such gloves meet the retest requirements of § 1910.268(f) (5).

One comment suggested that the final standard require rubber gloves to be inspected and air tested before each day's use (Comment No. 36). Since each inspection and testing will further indicate the condition of the gloves, and will be helpful in determining when such gloves must be taken out of service, it has been incorporated into the final rule.

8. Safety belts and straps. Proposed § 1910.336(b) (1) contained design requirements and test procedures for line-man's body belts, safety straps, and lanyards. Some commenters interpreted this section to require each body belt, safety strap, and lanyard to be tested by the employer. However, these tests were not intended to be performed by the user, nor is each body belt, safety strap, and lanyard required to be tested. Rather, these are laboratory tests of production samples. The final rule, in § 1910.268(g) (2) (i), makes clear the original intent. In addition to the testing of samples, which is required only for new equipment, acquired after the effective date of this requirement, the proposal required that all safety belts, straps and lanyards be examined at least semi-annually. This requirement for inspection of all such safety equipment is retained but the final standard requires that it be performed before each day's use. In view of the reliance placed on this safety equipment by the employee and in view of the relative ease with which these tests can be performed, daily inspections were considered appropriate to provide a safe workplace.

9. Ladders. § 1910.337(c) of the proposal provided, in part, that portable wood ladders intended for general use shall not be painted but may be coated with a translucent nonconductive coat-

ing. One witness supporting the proposal indicated that painted wooden ladders hide defects, and that the use of such ladders may result in employee injuries. The witness further indicated that the utility industry does not allow the use of painted ladders (Transcript page 41). However, another witness suggested that there are ways to determine whether a painted ladder is defective, other than by visual inspection. He indicated that such methods have been used successfully for many years. (Transcript page 166.) Furthermore, no data was offered into evidence to show that painted wooden ladders had caused injuries in the telecommunications industry.

In view of the above considerations, the final rule, in § 1910.268(h) (3), has been modified for existing ladders and now conforms with § 1910.25 which permits the use of painted wooden ladders. However, after the effective date of this standard, wooden ladders may not be painted but may be coated with a non-conductive translucent coating.

10. Potentially energized vehicles. Section 1910.343(k) (6) (iii) of the proposal would have permitted an employee to enter a potentially energized vehicle by cleanly jumping onto it. This would have been permitted only when other safe means of entry, such as first stepping onto an insulated blanket, were not available. Some witnesses interpreted this standard as providing that an employer could require an employee to jump cleanly onto an energized vehicle.

However, this procedure was intended only as a voluntary act in an emergency situation where necessary to save a fellow employee's life. This is, admittedly, a dangerous and difficult operation and, therefore, could not be made mandatory. Accordingly, this provision has not been included in the final rule.

11. Guarding manholes. Proposed § 1910.344(a) (2) provided that while work is being performed in manholes, a person trained in first aid shall be immediately available to render assistance if there is cause to believe that a hazard exists and such hazards could not be abated by certain specified means. There was some opposition to this provision by commenters advocating that the presence of an additional person be required whenever work was being performed in a manhole. They asserted that this hazard was recognized by the National Safety Council in its data sheet #260 (Comment No. 63).

In addition, it was shown that one state has a statute containing such a provision, as does one collective bargaining agreement (Comment No. 63; Exhibit 19).

However, there was also significant support for the proposal as written. One witness indicated that where portable ventilating equipment is properly employed and the employee follows his training instructions in assessing the manhole's atmosphere, the major hazards associated with manholes are eliminated (Transcript page 146). Other witnesses indicated that where manhole fatalities occur, the victim is usually the

person guarding the manhole, not the employee working in the manhole (Transcript pages 79, 129). These deaths usually result from persons being struck by motor vehicles. One witness stated that fatalities to employees guarding manholes were at least six times the number of fatalities to employees working in manholes (Transcript page 163).

Therefore, in view of the above considerations and the state of the evidence, the final rule in § 1910.268(o) (1) (ii), like the proposal, recognizes that in certain instances an additional employee must be present while work is being performed in a manhole, while in other instances the presence of an additional employee is unnecessary. The need for an additional employee is based on the existence of the safety hazard and on the adequacy of alternative means of protecting the employee in the manhole. Since it is impossible to delineate every situation in which an additional person must be present, the standard requires this person to be present when "there is cause for believing that a hazard exists". Examples are given of the types of situations in which such hazards are deemed to exist.

One commenter argued that the standard as written was vague. However, we do not believe this to be the case. There are situations other than those stated in the standard when an additional employee should be present, and the examples given adequately enables the employer to determine what these situations are. It is incumbent upon the employer, in such situations, to insure that the additional employee is present.

12. Microwave radiation exposure. Section 1910.345 of the proposal provided requirements for controlling employee exposure to microwave radiation. It provided, in part, that employees would not be permitted to enter areas where the power radiated density exceeded 10 mW/cm² unless the employees were equipped with personal protective equipment.

This proposal concurred with ANSI C95.1-1966, "Safety Level of Electromagnetic Radiation with Respect to Personnel," which also provides for a 10 mW/cm² exposure level. The ANSI standard indicated that under certain climatic conditions of high temperature and humidity, the permissible exposure level should be reduced. In an attempt to incorporate this consideration, calculations involving the temperature humidity index (THI) were proposed. However, numerous comments were received which indicated that this index was too restrictive and too difficult to determine and utilize (Comment Nos. 22, 59). Furthermore, these commenters stated that the formulation of this THI is based on data which the scientific community has challenged as erroneous. Therefore, the provisions involving the THI have not been included in the final rule.

Several commenters objected to the requirements for microwave protection garments because adequate procurement specifications for the garments were not included in the proposal (Comment Nos. 22, 59). Since such specifications are not

available, the requirements concerning microwave protection garments have not been included in the final rule, although protective garments or other personal protective equipment may, if effective, be used to reduce exposures.

The proposal would have permitted hotpatching either when protective garments were worn or by an alternate method set forth in § 1910.345(d) (1) and (2) of the proposal. However, since the requirements for protective garments have not been included in the final rule, and rather than allow only one method for hotpatching operations, it was considered to be more practicable to allow hotpatching provided such operations do not expose the employee to microwave radiation in excess of 10 mW/cm². Therefore, the specific requirement pertaining to hotpatching has not been included in the final rule, although hotpatching is permitted provided employee exposure does not exceed 10 mW/cm².

The final rule references the radiation protective guide contained in § 1910.97, and provides procedures to be taken to protect employees in this environment.

13. *Tree trimming.* Proposed § 1910.346 provided various requirements for tree trimming operations near energized lines. Several comments were received requesting clarification of the scope of the proposed rule. Some expressed the view that the standard required telecommunication employees to consider telecommunication wires energized with potentially fatal voltages when performing tree trimming operations incidental to their normal work. Since telecommunication workers are trained in the hazards and techniques associated with working on communication wires, they should not be precluded from contacting communication wires. The requirements of this section were derived from the American National Standard ANSI Z 133.1-1972, "Safety Requirements for Tree Pruning, Trimming, Repairing, or Removal." However, since the ANSI standard addressed tree trimmers and the proposal was intended to address telecommunication workers, there was some confusion as to the applicability of these requirements. Therefore, these requirements have been reworded to specifically address both telecommunication employees and other employees engaged in line-clearance tree trimming who perform work on behalf of a telecommunications system operator/owner.

Another commenter stated that it was questionable whether line-clearance tree trimmers should be subject to the clearance requirements contained in Table T-3 of proposed § 1910.346, rather than the clearance requirements contained in Table T-1 of § 1910.331 of the proposal which pertains to telecommunication employees (Comment No. 020). The nature of line-clearance tree trimming requires employees who perform this work to approach closer to electric power lines than employees who are engaged only in normal telecommunication work. Since employees qualified in line-clearance tree trimming are trained to work near electric power conductors, they are permitted to utilize the distances prescribed in Table R-3. It should be noted that these

distances are the same as given in ANSI Z133.1-1972, and apply to personnel who are qualified in line-clearance tree trimming.

14. *Buried Facilities.* Several commenters expressed the need for standards covering situations where telecommunication lines are buried in the same trench with electrical power conductors (Tr. 130, Comment Nos. 19, 20). A recommendation was made that a section be reserved for this purpose and that a task force be assigned to address this issue in the near future. This is an area which needs attention and the recommendation has been adopted. Accordingly, § 1910.268(r) has been reserved for this purpose.

15. *Retiring rooms.* Two comments were received recommending the inclusion of a requirement for retiring rooms contending that unique circumstances exist in the telecommunication industry (Comment Nos. 68, 20). However, medical evidence was submitted which indicated that retiring rooms do not enhance employee safety, and may, in fact, jeopardize it because an employee may choose to rest in such an area rather than seek proper medical attention which may be necessary (Exhibit 31). In addition, although certain scheduling practices may be common in this industry, they are by no means unique.

This matter was properly addressed in a previous hearing relating to a general industry requirement on retiring rooms and was not adopted based on that record (38 FR 9078). Since no persuasive evidence was submitted which established that the need for retiring rooms is unique to the telecommunications industry, and since such a requirement was not contained in the proposal, a provision for retiring rooms has not been included in the final rule.

Accordingly, upon consideration of the whole record of this proceeding, and pursuant to sections 6(b) and 8(c) of the Occupational Safety and Health Act of 1970 (84 Stat. 1593, 1599; 29 U.S.C. 655, 657), Secretary of Labor's Order No. 12-71 (36 FR 8754), and 29 CFR Part 1911, Part 1910 of Title 29, Code of Federal Regulations is hereby amended as follows:

1. In § 1910.67, paragraph (b) is revised and a new paragraph (c) is added, to read as follows:

§ 1910.67 Vehicle-mounted elevating and rotating work platforms.

(b) *General requirements.* (1) Unless otherwise provided in this section, aerial devices (aerial lifts) acquired on or after July 1, 1975, shall be designed and constructed in conformance with the applicable requirements of the American National Standard for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969, including appendix. Aerial lifts acquired for use before July 1, 1975 which do not meet the requirements of ANSI A92.2-1969, may not be used after July 1, 1976, unless they shall have been modified so as to conform with the applicable design and construction requirements of ANSI A92.2-1969. Aerial devices include the following

types of vehicle-mounted aerial devices used to elevate personnel to jobsites above ground: (i) Extensible boom platforms, (ii) aerial ladders, (iii) articulating boom platforms, (iv) vertical towers, and (v) a combination of any of the above. Aerial equipment may be made of metal, wood, fiberglass reinforced plastic (FRP), or other material; may be powered or manually operated; and are deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.

(2) Aerial lifts may be "field modified" for uses other than those intended by the manufacturer, provided the modification has been certified in writing by the manufacturer or by any other equivalent entity, such as a nationally recognized testing laboratory, to be in conformity with all applicable provisions of ANSI A92.2-1969 and this section, and to be at least as safe as the equipment was before modification.

(3) The requirements of this section do not apply to firefighting equipment or to the vehicles upon which aerial devices are mounted, except with respect to the requirement that a vehicle be a stable support for the aerial device.

(4) When operating aerial lifts proximate to, under, over, by or near electric power lines, the requirements of this paragraph (b) (4) shall apply.

(i) The following clearances shall be maintained:

(A) For lines rated at 50kV or less, the minimum clearance between the lines and any part of the aerial lift shall be at least 10 feet;

(B) When the lines are rated in excess of 50 kV, the minimum clearance between the lines and any part of the aerial lift shall be at least 10 feet plus 0.4 inch for each kilovolt in excess of 50kV, or twice the length of the line insulator, but never less than 10 feet;

(C) the requirements set forth in paragraph (b) (4) (i) of this section do not apply (1) where the work is performed from an aerial device insulated for the work, and the work is performed by either telecommunication employees, line-clearance tree-trimming employees, or electric utility employees; or (2) where the electric power transmission or distribution lines have been de-energized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the aerial lift, have been erected to prevent physical contact with the lines.

(ii) Proximity warning devices may be used, but not in lieu of meeting the requirements contained in paragraph (b) (4) (i) of this section.

(iii) The owner of the lines or his authorized representative shall be notified and provided with all pertinent information before the commencement of operations near electrical lines.

(iv) Any overhead wire shall be considered to be an energized line until the owner of the line or his authorized representative states that it is deenergized.

(c) *Specific requirements*—(1) *Ladder trucks and tower trucks.* Before the truck is moved for highway travel, aerial ladders shall be secured in the lower traveling position by the locking device

above the truck cab, and the manually operated device at the base of the ladder, or by other equally effective means (e.g., cradles which prevent rotation of the ladder in combination with positive acting linear actuators).

(2) *Extensible and articulating boom platforms.* (i) Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.

(ii) Only trained persons shall operate an aerial lift.

(iii) Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.

(iv) Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.

(v) A body belt shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.

(vi) Boom and basket load limits specified by the manufacturer shall not be exceeded.

(vii) The brakes shall be set and outriggers, when used, shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using an aerial lift on an incline.

(viii) An aerial lift truck may not be moved when the boom is elevated in a working position with men in the basket, except for equipment which is specifically designed for this type of operation in accordance with the provisions of paragraphs (b) (1) and (b) (2) of this section.

(ix) Articulating boom and extensible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

(x) Climbers shall not be worn while performing work from an aerial lift.

(xi) The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

(xii) Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position, except as provided in paragraph (c) (2) (viii) of this section.

(3) *Electrical tests.* Electrical tests shall be made in conformance with the requirements of ANSI A92.2-1969, Section 5. However, equivalent DC voltage tests may be used in lieu of the AC voltage test specified in A92.2-1969. DC voltage tests which are approved by the equipment manufacturer or equivalent entity shall be considered an equivalent test for the purpose of this paragraph (c) (3).

(4) *Bursting safety factor.* All critical hydraulic and pneumatic components shall comply with the provisions of the American National Standards Institute standard, ANSI A92.2-1969, Section 4.9

Bursting Safety Factor. Critical components are those in which a failure would result in a free fall or free rotation of the boom. All noncritical components shall have a bursting safety factor of at least two to one.

(5) *Welding standards.* All welding shall conform to the following Automotive Welding Society (AWS) Standards, as applicable:

(i) Standard Qualification Procedure, AWS B3.0-41.

(ii) Recommended Practices for Automotive Welding Design, AWS D8.4-61.

(iii) Standard Qualification of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-69.

(iv) Specifications for Welding Highway and Railway Bridges, AWS D2.0-69.

2. Section 1910.70 is revised to read as follows:

§ 1910.70 Standards organizations.

Specific standards of the following organizations have been referenced in this subpart. Copies of the standards may be obtained from the issuing organization.

American National Standards Institute
1430 Broadway
New York, New York 10018
American Welding Society
2501 NW. 7th Street
Miami, Florida 33125

3. A new § 1910.183 is added to read as follows:

§ 1910.183 Helicopters.

(a) *Helicopter regulations.* Helicopter cranes shall be expected to comply with any applicable regulations of the Federal Aviation Administration.

(b) *Briefing.* Prior to each day's operation a briefing shall be conducted. This briefing shall set forth the plan of operation for the pilot and ground personnel.

(c) *Slings and tag lines.* Loads shall be properly slung. Tag lines shall be of a length that will not permit their being drawn up into the rotors. Pressed sleeve, swaged eyes, or equivalent means shall be used for all freely suspended loads to prevent hand splices from spinning open or cable clamps from loosening.

(d) *Cargo hooks.* All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The employer shall ensure that the hooks are tested prior to each day's operation by a competent person to determine that the release functions properly, both electrically and mechanically.

(e) *Personal protective equipment.* (1) Personal protective equipment shall be provided and the employer shall ensure its use by employees receiving the load. Personal protective equipment shall consist of complete eye protection and hardhats secured by chinstraps.

(2) Loose-fitting clothing likely to flap in rotor downwash, and thus be snagged on the hoist line, may not be worn.

(f) *Loose gear and objects.* The employer shall take all necessary precautions to protect employees from flying objects in the rotor downwash. All loose

gear within 100 feet of the place of lifting the load or depositing the load, or within all other areas susceptible to rotor downwash, shall be secured or removed.

(g) *Housekeeping.* Good housekeeping shall be maintained in all helicopter loading and unloading areas.

(h) *Load safety.* The size and weight of loads, and the manner in which loads are connected to the helicopter shall be checked. A lift may not be made if the helicopter operator believes the lift cannot be made safely.

(i) *Hooking and unhooking loads.* When employees perform work under hovering craft, a safe means of access shall be provided for employees to reach the hoist line hook and engage or disengage cargo slings. Employees may not be permitted to perform work under hovering craft except when necessary to hook or unhook loads.

(j) *Static charge.* Static charge on the suspended load shall be dissipated with a grounding device before ground personnel touch the suspended load, unless protective rubber gloves are being worn by all ground personnel who may be required to touch the suspended load.

(k) *Weight limitation.* The weight of an external load shall not exceed the helicopter manufacturer's rating.

(l) *Ground lines.* Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay out" from a container or roll off a reel, shall not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

(m) *Visibility.* Ground personnel shall be instructed and the employer shall ensure that when visibility is reduced by dust or other conditions, they shall exercise special caution to keep clear of main and stabilizing rotors. Precautions shall also be taken by the employer to eliminate, as far as practical, the dust or other conditions reducing the visibility.

(n) *Signal systems.* The employer shall instruct the aircrew and ground personnel on the signal systems to be used and shall review the system with the employees in advance of hoisting the load. This applies to both radio and hand signal systems. Hand signals, where used, shall be as shown in Figure N-1.

(o) *Approach distance.* No employee shall be permitted to approach within 50 feet of the helicopter when the rotor blades are turning, unless his work duties require his presence in that area.

(p) *Approaching helicopter.* The employer shall instruct employees, and shall ensure, that whenever approaching or leaving a helicopter which has its blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. No employee shall be permitted to work in the area from the cockpit or cabin rearward while blades are rotating, unless authorized by the helicopter operator to work there.

(q) *Personnel.* Sufficient ground personnel shall be provided to ensure that helicopter loading and unloading operations can be performed safely.

(r) *Communications.* There shall be constant reliable communication between the pilot and a designated employee of the ground crew who acts as a signalman during the period of loading

and unloading. This signalman shall be clearly distinguishable from other ground personnel.

(s) Fires. Open fires shall not be permitted in areas where they could be spread by the rotor downwash.



FIGURE N-1 HELICOPTER HAND SIGNAL

§ 1910.189 [Redesignated]

4. Section 1910.183, *Sources of standards*, is redesignated as § 1910.189.

§ 1910.190 [Redesignated]

5. Section 1910.184, *Standards organizations*, is redesignated as § 1910.190.

6. A new § 1910.268 is added to read as follows:

§ 1910.268 Telecommunications.

(a) *Application.* (1) This section sets forth safety and health standards that apply to the work conditions, practices, means, methods, operations, installations and processes performed at telecommunications centers and at telecommunications field installations, which are located outdoors or in building spaces used for such field installations. "Center" work includes the installation, operation, maintenance, rearrangement, and removal of communications equipment and other associated equipment in telecommunications switching centers. "Field" work includes the installation, operation, maintenance, rearrangement, and removal of conductors and other equipment used for signal or communication service, and of their supporting or containing structures, overhead or underground, on public or private rights of way, including buildings or other structures.

(2) These standards do not apply: (i) To construction work, as defined in § 1910.12, nor (ii) to installations under the exclusive control of electric utilities used for the purpose of communications or metering, or for generation, control, transformation, transmission, and distribution of electric energy, which are located in buildings used exclusively by the electric utilities for such purposes, or located outdoors on property owned or leased by the electric utilities or on public highways, streets, roads, etc., or outdoors by established rights on private property.

(3) Operations or conditions not specifically covered by this section are subject to all the applicable standards contained in this Part 1910. See § 1910.5(c). Operations which involve construction work, as defined in § 1910.12 are subject to all the applicable standards contained in Part 1926 of this chapter.

(b) *General*—(1) *Buildings containing telecommunications centers.*—(i) *Illumination.* Lighting in telecommunication centers shall be provided in an adequate amount such that continuing work operations, routine observations, and the passage of employees can be carried out in a safe and healthful manner. Certain specific tasks in centers, such as splicing cable and the maintenance and repair of equipment frame lineups, may require a higher level of illumination. In such cases, the employer shall install permanent lighting or portable supplemental lighting to attain a higher level of illumination shall be provided as needed to permit safe performance of the required task.

(ii) *Working surfaces.* Guard rails and toe boards may be omitted on distribution frame mezzanine platforms to permit access to equipment. This exemption applies only on the side or sides of

the platform facing the frames and only on those portions of the platform adjacent to equipped frames.

(iii) *Working spaces.* "Maintenance aisles," or "wiring aisles," between equipment frame lineups are working spaces and are not a means of egress for purposes of § 1910.35(a).

(iv) *Special doors.* When blastproof or power actuated doors are installed in specially designed hardsite security buildings and spaces, they shall be designed and installed so that they can be used as a means of egress in emergencies.

(v) *Equipment, machinery and machine guarding.* When power plant machinery in telecommunications centers is operated with commutators and couplings uncovered, the adjacent housing shall be clearly marked to alert personnel to the rotating machinery.

(2) *Battery handling.* (i) Eye protection devices which provide side as well as frontal eye protection for employees shall be provided when measuring storage battery specific gravity or handling electrolyte, and the employer shall ensure that such devices are used by the employees. The employer shall also ensure that acid resistant gloves and aprons shall be worn for protection against spattering. Facilities for quick drenching or flushing of the eyes and body shall be provided unless the storage batteries are of the enclosed type and equipped with explosion proof vents, in which case sealed water rinse or neutralizing packs may be substituted for the quick drenching or flushing facilities. Employees assigned to work with storage batteries shall be instructed in emergency procedures such as dealing with accidental acid spills.

(ii) Electrolyte (acid or base, and distilled water) for battery cells shall be mixed in a well ventilated room. Acid or base shall be poured gradually, while stirring, into the water. Water shall never be poured into concentrated (greater than 75 percent) acid solutions. Electrolyte shall never be placed in metal containers nor stirred with metal objects.

(iii) When taking specific gravity readings, the open end of the hydrometer shall be covered with an acid resistant material while moving it from cell to cell to avoid splashing or throwing the electrolyte.

(3) *Medical and first aid.* First aid supplies recommended by a consulting physician shall be placed in weather-proof containers (unless stored indoors) and shall be easily accessible. Each first aid kit shall be inspected at least once a month. Expended items shall be replaced.

(4) *Hazardous materials.* Highway mobile vehicles and trailers stored in garages in accordance with § 1910.110 may be equipped to carry more than one LP-gas container, but the total capacity of LP-gas containers per work vehicle stored in garages shall not exceed 100 pounds of LP-gas. All container valves shall be closed when not in use.

(5) *Compressed gas.* When using or transporting nitrogen cylinders in a hori-

zontal position, special compartments, racks, or adequate blocking shall be provided to prevent cylinder movement. Regulators shall be removed or guarded before a cylinder is transported.

(6) *Support structures.* No employee, or any material or equipment, may be supported or permitted to be supported on any portion of a pole structure, platform, ladder, walkway or other elevated structure or aerial device unless the employer ensures that the support structure is first inspected by a competent person and it is determined to be adequately strong, in good working condition and properly secured in place.

(7) *Approach distances to energized overhead power lines and parts.* The employer shall ensure that no employee approaches or takes any conductive object closer to any electrically energized overhead power lines and parts than prescribed in Table R-2, unless:

(i) The employee is insulated or guarded from the energized parts (insulating gloves rated for the voltage involved shall be considered adequate insulation), or

(ii) The energized parts are insulated or guarded from the employee and any other conductive object at a different potential, or

(iii) The power conductors and equipment are deenergized and grounded.

TABLE R-2—APPROACH DISTANCES TO EXPOSED ENERGIZED OVERHEAD POWER LINES AND PARTS

Voltage range (phase to phase, RMS)	Approach distance (inches)
300 V and less.....	(1)
Over 300V, not over 750V.....	12
Over 750V not over 2 kV.....	18
Over 2 kV, not over 15 kV.....	24
Over 15 kV, not over 37 kV.....	36
Over 37 kV, not over 87.5 kV.....	42
Over 87.5 kV, not over 121 kV.....	48
Over 121 kV, not over 140 kV.....	54

¹ Avoid contact.

(8) *Illumination of field work.* Whenever natural light is insufficient to adequately illuminate the worksite, artificial illumination shall be provided to enable the employee to perform the work safely.

(c) *Training.* Employers shall provide training in the various precautions and safe practices described in this section and shall insure that employees do not engage in the activities to which this section applies until such employees have received proper training in the various precautions and safe practices required by this section. However, where the employer can demonstrate that an employee is already trained in the precautions and safe practices required by this section prior to his employment, training need not be provided to that employee in accordance with this section. Where training is required, it shall consist of on-the-job training or classroom-type training or a combination of both. The training program shall include a list of the subject courses and the types of personnel required to receive such instruction. A written description of the training program and a record of employees who have received such training shall be maintained for the duration of

the employee's employment and shall be made available upon request to the Assistant Secretary for Occupational Safety and Health. Such training shall, where appropriate, include the following subjects:

(1) Recognition and avoidance of dangers relating to encounters with harmful substances, and animal, insect, or plant life.

(2) Procedures to be followed in emergency situations, and

(3) First aid training, including instruction in artificial respiration.

(d) *Employee protection in public work areas.* (1) Before work is begun in the vicinity of vehicular or pedestrian traffic which may endanger employees, warning signs and/or flags or other traffic control devices shall be placed conspicuously to alert and channel approaching traffic. Where further protection is needed, barriers shall be utilized. At night, warning lights shall be prominently displayed, and excavated areas shall be enclosed with protective barricades.

(2) If work exposes energized or moving parts that are normally protected, danger signs shall be displayed and barricades erected, as necessary, to warn other personnel in the area.

(3) The employer shall insure that an employee finding any crossed or fallen wires which create or may create a hazardous situation at the work area: (i) Remains on guard or adopts other adequate means to warn other employees of the danger and (ii) has the proper authority notified at the earliest practical moment.

(e) *Tools and personal protective equipment—Generally.* Personal protective equipment, protective devices and special tools needed for the work of employees shall be provided and the employer shall ensure that they are used by employees. Before each day's use the employer shall ensure that these personal protective devices, tools, and equipment are carefully inspected by a competent person to ascertain that they are in good condition.

(f) *Rubber insulating equipment.* (1) Rubber insulating equipment designed for the voltage levels to be encountered shall be provided and the employer shall ensure that they are used by employees as required by this section. This equipment shall meet the electrical and physical requirements contained in ANSI J6.6-1971 "Standard Specifications for Rubber Insulating Gloves," and ANSI J6.4-1971 "Standard Specifications for Rubber Insulating Blankets," with the exception that the maximum proof test current for a 14 inch Class I glove shall be no more than 14 mA, and with the further exception that existing 14 inch Class I rubber gloves that meet a maximum proof test current of 16 mA and a minimum breakdown voltage of 17,000 volts (RMS) acquired prior to July 1, 1975 may be used as long as these gloves comply with the retest requirements of paragraph (f) (5) of this section.

(2) When these gloves are used on jobs where they may be torn, they shall

be protected with heavy outer canvas or leather gloves.

(3) Insulating gloves may be of multiply construction with contrasting colors to aid in the detection of cuts, cracks, and deep abrasions.

(4) Protective equipment fabricated of material other than rubber shall provide electrical and mechanical protection at least equal to that of the rubber equipment.

(5) The employer is responsible for the periodic retesting of all insulating gloves, blankets, and other rubber insulating equipment. This retesting shall be electrical, visual and mechanical. The following maximum retesting intervals shall apply:

Gloves, blankets, and other insulating equipment	Natural rubber		Synthetic rubber	
	Months	Months	Months	Months
New.....	12	18	12	18
Re-issued.....	9	15	9	15

(6) Gloves and blankets shall be marked to indicate compliance with the retest schedule, and shall be marked with the date the next test is due. Gloves found to be defective in the field or by the tests set forth in paragraph (f) (5) of this section shall be destroyed by cutting them open from the finger to the gauntlet.

(7) When not being used, insulating gloves shall be stored in glove bags or in their original containers. Insulating blankets shall be stored in a canister or other device which offers equivalent protection.

(8) Insulating gloves and blankets shall be stored away from direct sunlight, steampipes, radiators and other sources of excessive heat. Gloves and blankets shall not be folded while in storage; however, blankets may be rolled for storage.

(9) Rubber gloves shall be visually inspected and air tested prior to each day's use.

(g) *Personal climbing equipment.*

(1) *General.* Safety belts and straps shall be provided and the employer shall ensure their use when work is performed at positions more than 4 feet above ground, on poles, and on towers, except as provided in paragraphs (n) (7) and (n) (8) of this section. No safety belts, safety straps or lanyards acquired after July 1, 1975 may be used unless they meet the tests set forth in paragraph (g) (2) of this section. The employer shall ensure that all safety belts and straps are inspected by a competent person prior to each day's use to determine that they are in safe working condition.

(2) *Telecommunication lineman's body belts, safety straps, and lanyards.*

(A) *General requirements.* Hardware for lineman's body belts, safety straps, and lanyards shall be drop forged or pressed steel and shall have a corrosion resistant finish tested to meet the requirements of the American Society for Testing and Materials B117-64 (50-hour test). Surfaces shall be smooth and free of sharp

edges. Production samples of lineman's safety straps, body belts and lanyards shall be approved by a nationally recognized testing laboratory, as having been tested in accordance with and as meeting the requirements of this paragraph.

(B) All buckles shall withstand a 2,000-pound tensile test with a maximum permanent deformation no greater than one sixty-fourth inch.

(C) D rings shall withstand a 5,000-pound tensile test without cracking or breaking.

(D) Snaphooks shall withstand a 5,000-pound tensile test, or shall withstand a 3,000-pound tensile test and a 180° bend test. Tensile failure is indicated by distortion of the snaphook sufficient to release the keeper; bend test failure is indicated by cracking of the snaphook.

(i) *Specific requirements.* (A) (1) All fabric used for safety straps shall be capable of withstanding an A.C. dielectric test of not less than 25,000 volts per foot "dry" for 3 minutes, without visible deterioration.

(2) All fabric and leather used shall be tested for leakage current. Fabric or leather may not be used if the leakage current exceeds 1 milliamperes when a potential of 3,000 volts is applied to the electrodes positioned 12 inches apart.

(3) In lieu of alternating current tests, equivalent direct current tests may be performed.

(B) The cushion part of the body belt shall:

(1) Contain no exposed rivets on the inside. This provision does not apply to belts used by craftsmen not engaged in line work.

(2) Be at least three inches in width;

(3) Be at least five thirty-seconds (5/32) inch thick, if made of leather; and

(4) Have pocket tabs that extend at least 1 1/2 inches down and three inches back of the inside of the circle of each D ring for riveting on piler or tool pockets. On shifting D ring belts, this measurement for pocket tabs shall be taken when the D ring section is centered.

(C) There may be no more than four tool loops on any body belt.

(D) Suitable copper, steel, or equivalent liners shall be used around the bars of D rings to prevent wear between these members and the leather or fabric enclosing them.

(E) All stitching shall be done with a minimum 42-pound weight nylon or equivalent thread and shall be lock stitched. Stitching parallel to an edge may not be less than three-sixteenths (3/16) inch from the edge of the narrowest member caught by the thread. The use of cross stitching on leather is prohibited.

(F) The keepers of snaphooks shall have a spring tension that will not allow the keeper to begin to open when a weight of 2 1/2 pounds or less is applied, but the keepers shall begin to open when a weight of four pounds is applied. In making this determination, the weight shall be supported on the keeper against the end of the nose.

(G) Safety straps, lanyards, and body belts shall be tested in accordance with the following procedure:

(1) Attach one end of the safety strap or lanyard to a rigid support, and the other end to a 250-pound canvas bag of sand;

(2) Allow the 250-pound canvas bag of sand to free fall 4 feet when testing safety straps and 6 feet when testing lanyards. In each case, the strap or lanyard shall stop the fall of the 250-pound bag;

(3) Failure of the strap or lanyard shall be indicated by any breakage or slippage sufficient to permit the bag to fall free from the strap or lanyard.

(4) The entire "body belt assembly" shall be tested using one D ring. A safety strap or lanyard shall be used that is capable of passing the "impact loading test" described in paragraph (g) (2) (ii) (G) (2) of this section and attached as required in paragraph (g) (2) (ii) (G) (1) of this section. The body belt shall be secured to the 250-pound bag of sand at a point which simulates the waist of a man and shall be dropped as stated in paragraph (g) (2) (ii) (G) (2) of this section. Failure of the body belt shall be indicated by any breakage or slippage sufficient to permit the bag to fall free from the body belt.

(3) *Pole climbers.* (1) Pole climbers may not be used if the gaffs are less than 1 1/4 inches in length as measured on the underside of the gaff. The gaffs of pole climbers shall be covered with safety caps when not being used for their intended use.

(ii) The employer shall ensure that pole climbers are inspected by a competent person for the following conditions: Fractured or cracked gaffs or leg irons, loose or dull gaffs, broken straps or buckles. If any of these conditions exist, the defect shall be corrected before the climbers are used.

(iii) Pole climbers shall be inspected as required in this paragraph (g) (3) before each day's use and a gaff cut-out test performed at least weekly when in use.

(iv) Pole climbers may not be worn when:

(A) Working in trees (specifically designed tree climbers shall be used for tree climbing),

(B) Working on ladders,

(C) Working in an aerial lift,

(D) Driving a vehicle, nor

(E) Walking on rocky, hard, frozen, brushy or hilly terrain.

(h) *Ladders.* (1) The employer shall ensure that no employee nor any material or equipment may be supported or permitted to be supported on any portion of a ladder unless it is first determined, by inspections and checks conducted by a competent person that such ladder is adequately strong, in good condition, and properly secured in place, as required in Subpart D of this part and as required in this section.

(2) The spacing between steps or rungs permanently installed on poles and towers shall be no more than 18 inches

(36 inches on any one side). This requirement also applies to fixed ladders on towers, when towers are so equipped. Spacing between steps shall be uniform above the initial unstepped section, except where working, standing, or access steps are required. Fixed ladder rungs and step rungs for poles and towers shall have a minimum diameter of $\frac{5}{8}$ ". Fixed ladder rungs shall have a minimum clear width of 12 inches. Steps for poles and towers shall have a minimum clear width of $4\frac{1}{2}$ inches. The spacing between detachable steps may not exceed 30 inches on any one side, and these steps shall be properly secured when in use.

(3) After April 30, 1975, portable wood ladders intended for general use may not be painted but may be coated with a translucent nonconductive coating. Portable wood ladders may not be longitudinally reinforced with metal.

(4) Portable wood ladders that are not being carried on vehicles and are not in active use shall be stored where they will not be exposed to the elements and where there is good ventilation.

(5) The provisions of § 1910.25(c) (5) shall apply to rolling ladders used in telecommunications centers, except that such ladders shall have a minimum inside width, between the side rails, of at least eight inches.

(6) Climbing ladders or stairways on scaffolds used for access and egress shall be affixed or built into the scaffold by proper design and engineering, and shall be so located that their use will not disturb the stability of the scaffold. The rungs of the climbing device shall be equally spaced, but may not be less than 12 inches nominal nor more than 16 inches nominal apart. Horizontal end rungs used for platform support may also be utilized as a climbing device if such rungs meet the spacing requirement of this paragraph (h) (6), and if there is sufficient clearance between the rung and the edge of the platform to afford an adequate handhold. If a portable ladder is affixed to the scaffold, it shall be securely attached and shall have rungs meeting the spacing requirements of this paragraph (h) (6). Clearance shall be provided in the back of the ladder of not less than 6 inches from center of rung to the nearest scaffold structural member.

(7) When a ladder is supported by an aerial strand, and ladder hooks or other supports are not being used, the ladder shall be extended at least 2 feet above the strand and shall be secured to it (e.g. lashed or held by a safety strap around the strand and ladder side rail). When a ladder is supported by a pole, it shall be securely lashed to the pole unless the ladder is specifically designed to prevent movement when used in this application.

(8) The following requirements apply to metal manhole ladders. (i) Metal manhole ladders shall be free of structural defects and free of accident hazards such as sharp edges and burrs. The metal shall be protected against corrosion unless inherently corrosion-resistant.

(ii) These ladders may be designed with parallel side rails, or with side rails varying uniformly in separation along the length (tapered), or with side rails flaring at the base to increase stability.

(iii) The spacing of rungs or steps shall be on 12-inch centers.

(iv) Connections between rungs or steps and siderails shall be constructed to insure rigidity as well as strength.

(v) Rungs and steps shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping.

(vi) Ladder hardware shall meet the strength requirements of the ladder's component parts and shall be of a material that is protected against corrosion unless inherently corrosion-resistant. Metals shall be so selected as to avoid excessive galvanic action.

(i) *Other tools and personal protective equipment*—(1) *Head protection*. Head protection meeting the requirements of ANSI Z89.2-1971, "Safety Requirements for Industrial Protective Helmets for Electrical Workers, Class E" shall be provided whenever there is exposure to possible high voltage electrical contact, and the employer shall ensure that the head protection is used by employees.

(2) *Eye protection*. Eye protection meeting the requirements of § 1910.133 (a) (2) thru (a) (6) shall be provided and the employer shall ensure its use by employees where foreign objects may enter the eyes due to work operations such as but not limited to:

(i) Drilling or chipping stone, brick or masonry, breaking concrete or pavement, etc. by hand tools (sledgehammer, etc.) or power tools such as pneumatic drills or hammers;

(ii) Working on or around high speed emery or other grinding wheels unprotected by guards;

(iii) Cutting or chipping terra cotta ducts, tile, etc.;

(iv) Working under motor vehicles requiring hammering;

(v) Cleaning operations using compressed air, steam, or sand blast;

(vi) Acetylene welding or similar operations where sparks are thrown off;

(vii) Using powder actuated stud drivers;

(viii) Tree pruning or cutting underbrush;

(ix) Handling battery cells and solutions, such as taking battery readings with a hydrometer and thermometer;

(x) Removing or rearranging strand or open wire; and

(xi) Performing lead sleeve wiping and while soldering.

(3) *Tent heaters*. Flame-type heaters may not be used within ground tents or on platforms within aerial tents unless:

(i) The tent covers are constructed of fire resistant materials, and

(ii) Adequate ventilation is provided to maintain safe oxygen levels and avoid harmful buildup of combustion products and combustible gases.

(4) *Torches*. Torches may be used on aerial splicing platforms or in buckets

enclosed by tents provided the tent material is constructed of fire resistant material and the torch is turned off when not in actual use. Aerial tents shall be adequately ventilated while the torch is in operation.

(5) *Portable power equipment*. Nominal 120V, or less, portable generators used for providing power at work locations do not require grounding if the output circuit is completely isolated from the frame of the unit.

(6) *Vehicle-mounted utility generators*. Vehicle-mounted utility generators used for providing nominal 240V AC or less for powering portable tools and equipment need not be grounded to earth if all of the following conditions are met:

(i) One side of the voltage source is solidly strapped to the metallic structure of the vehicle;

(ii) Grounding-type outlets are used, with a "grounding" conductor between the outlet grounding terminal and the side of the voltage source that is strapped to the vehicle;

(iii) All metallic encased tools and equipment that are powered from this system are equipped with three-wire cords and grounding-type attachment plugs, except as designated in paragraph (i) (7) of this section.

(7) *Portable lights, tools, and appliances*. Portable lights, tools, and appliances having noncurrent-carrying external metal housing may be used with power equipment described in paragraph (i) (5) of this section without an equipment grounding conductor. When operated from commercial power such metal parts of these devices shall be grounded, unless these tools or appliances are protected by a system of double insulation, or its equivalent. Where such a system is employed, the equipment shall be distinctively marked to indicate double insulation.

(8) *Soldering devices*. Grounding shall be omitted when using soldering irons, guns or wire-wrap tools on telecommunications circuits.

(9) *Lead work*. The wiping of lead joints using melted solder, gas fueled torches, soldering irons or other appropriate heating devices, and the soldering of wires or other electrical connections do not constitute the welding, cutting and brazing described in Subpart Q of this part. When operated from commercial power the metal housing of electric solder pots shall be grounded. Electric solder pots may be used with the power equipment described in paragraph (i) (5) of this section without a grounding conductor. The employer shall ensure that wiping gloves or cloths and eye protection are used in lead wiping operations. A drip pan to catch hot lead drippings shall also be provided and used.

(j) *Vehicle-mounted material handling devices and other mechanical equipment*—(1) *General*. (i) The employer shall ensure that visual inspections are made of the equipment by a competent person each day the equipment is to be used to ascertain that it is in good condition.

(1) The employer shall ensure that tests shall be made at the beginning of each shift by a competent person to insure the vehicle brakes and operating systems are in proper working condition.

(2) *Scrapers, loaders, dozers, graders and tractors.* (1) All rubber-tired, self-propelled scrapers, rubber-tired front end loaders, rubber-tired dozers, agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in telecommunications work shall have rollover protective structures that meet the requirements of Subpart W of Part 1926 of this Title.

(ii) Eye protection shall be provided and the employer shall ensure that it is used by employees when working in areas where flying material is generated.

(3) *Vehicle-mounted elevating and rotating work platforms.* These devices shall not be operated with any conductive part of the equipment closer to exposed energized power lines than the clearances set forth in Table R-2 of this section.

(4) *Derrick trucks and similar equipment.* (1) This equipment shall not be operated with any conductive part of the equipment closer to exposed energized power lines than the clearances set forth in Table R-2 of this section.

(ii) When derricks are used to handle poles near energized power conductors, these operations shall comply with the requirements contained in paragraphs (b) (7) and (n) (11) of this section.

(iii) Moving parts of equipment and machinery carried on or mounted on telecommunications line trucks shall be guarded. This may be done with barricades as specified in paragraph (d) (2) of this section.

(iv) Derricks and the operation of derricks shall comply with the following requirements: (A) Manufacturer's specifications, load ratings and instructions for derrick operation shall be strictly observed.

(B) Rated load capacities and instructions related to derrick operation shall be conspicuously posted on a permanent weather-resistant plate or decal in a location on the derrick that is plainly visible to the derrick operator.

(C) Prior to derrick operation the parking brake must be set and the stabilizers extended if the vehicle is so equipped. When the vehicle is situated on a grade, at least two wheels must be chocked on the downgrade side.

(D) Only persons trained in the operation of the derrick shall be permitted to operate the derrick.

(E) Hand signals to derrick operators shall be those prescribed by ANSI B30.6-1969, "Safety Code for Derricks".

(F) The employer shall ensure that the derrick and its associated equipment are inspected by a competent person at intervals set by the manufacturer but in no case less than once per year. Records shall be maintained including the dates of inspections, and necessary repairs made, if corrective action was required.

(G) Modifications or additions to the derrick and its associated equipment that

alter its capacity or affect its safe operation shall be made only with written certification from the manufacturer, or other equivalent entity, such as a nationally recognized testing laboratory, that the modification results in the equipment being safe for its intended use. Such changes shall require the changing and posting of revised capacity and instruction decals or plates. These new ratings or limitations shall be as provided by the manufacturer or other equivalent entity.

(H) Wire rope used with derricks shall be of improved plow steel or equivalent. Wire rope safety factors shall be in accordance with American National Standards Institute B30.6-1969.

(I) Wire rope shall be taken out of service, or the defective portion removed, when any of the following conditions exist: (1) The rope strength has been significantly reduced due to corrosion, pitting, or excessive heat, or

(2) The thickness of the outer wires of the rope has been reduced to two-thirds or less of the original thickness, or

(3) There are more than six broken wires in any one rope lay, or

(4) There is excessive permanent distortion caused by kinking, crushing, or severe twisting of the rope.

(k) *Materials handling and storage—*

(1) *Poles—*When working with poles in piles or stacks, work shall be performed from the ends of the poles as much as possible, and precautions shall be taken for the safety of employees at the other end of the pole. During pole hauling operations, all loads shall be secured to prevent displacement. Lights, reflectors and/or flags shall be displayed on the end and sides of the load as necessary. The requirements for installation, removal, or other handling of poles in pole lines are prescribed in paragraph (n) of this section which pertains to overhead lines. In the case of hoisting machinery equipped with a positive stop load-holding device, it shall be permissible for the operator to leave his position at the controls (while a load is suspended) for the sole purpose of assisting in positioning the load prior to landing it. Prior to unloading steel, poles, crossarms, and similar material, the load shall be thoroughly examined to ascertain that the load has not shifted, that binders or stakes have not broken, and that the load is not otherwise hazardous to employees.

(2) *Cable reels.* Cable reels in storage shall be checked or otherwise restrained when there is a possibility that they might accidentally roll from position.

(l) *Cable fault locating and testing.*

(1) Employees involved in using high voltages to locate trouble or test cables shall be instructed in the precautions necessary for their own safety and the safety of other employees.

(2) Before the voltage is applied, cable conductors shall be isolated to the extent practicable. Employees shall be warned, by such techniques as briefing and tagging at all affected locations, to stay clear while the voltage is applied.

(m) *Grounding for employee protection—pole lines—(1) Power conductors.* Electric power conductors and equipment shall be considered as energized unless the employee can visually determine that they are bonded to one of the grounds listed in paragraph (m) (4) of this section.

(2) *Nonworking open wire.* Nonworking open wire communications lines shall be bonded to one of the grounds listed in paragraph (m) (4) of this section.

(3) *Vertical power conduit, power ground wires and street light fixtures.* (1) Metal power conduit on joint use poles, exposed vertical power ground wires, and street light fixtures which are below communications attachments or less than 20 inches above these attachments, shall be considered energized and shall be tested for voltage unless the employee can visually determine that they are bonded to the communications suspension strand or cable sheath.

(ii) If no hazardous voltage is shown by the voltage test, a temporary bond shall be placed between such street light fixture, exposed vertical power grounding conductor, or metallic power conduit and the communications cable strand. Temporary bonds used for this purpose shall have sufficient conductivity to carry at least 500 amperes for a period of one second without fusing.

(4) *Suitable protective grounding.* Acceptable grounds for protective grounding are as follows:

(1) A vertical ground wire which has been tested, found safe, and is connected to a power system multigrounded neutral or the grounded neutral of a power secondary system where there are at least three services connected;

(ii) Communications cable sheath or shield and its supporting strand where the sheath or shield is:

(A) Bonded to an underground or buried cable which is connected to a central office ground, or

(B) Bonded to an underground metallic piping system, or

(C) Bonded to a power system multigrounded neutral or grounded neutral of a power secondary system which has at least three services connected;

(iii) Guys which are bonded to the grounds specified in paragraphs (m) (4) (i) and (ii) of this section and which have continuity uninterrupted by an insulator; and

(iv) If all of the preceding grounds are not available, arrays of driven ground rods where the resultant resistance to ground will be low enough to eliminate danger to personnel or permit prompt operation of protective devices.

(5) *Attaching and removing temporary bonds.* When attaching grounds (bonds), the first attachment shall be made to the protective ground. When removing bonds, the connection to the line or equipment shall be removed first. Insulating gloves shall be worn during these operations.

(6) *Temporary grounding of suspension strand.* (1) The suspension strand shall be grounded to the existing grounds

listed in paragraph (m) (4) of this section when being placed on jointly used poles or during thunderstorm activity.

(ii) Where power crossings are encountered on nonjoint lines, the strand shall be bonded to an existing ground listed in paragraph (m) (4) of this section as close as possible to the crossing. This bonding is not required where crossings are made on a common crossing pole unless there is an upward change in grade at the pole.

(iii) Where roller-type bonds are used, they shall be restrained so as to avoid stressing the electrical connections.

(iv) Bonds between the suspension strand and the existing ground shall be at least No. 6AWG copper.

(v) Temporary bonds shall be left in place until the strand has been tensioned, dead-ended, and permanently grounded.

(vi) The requirements of paragraphs (m) (6) (i) through (m) (6) (v) of this section do not apply to the installation of insulated strand.

(7) *Antenna work-radio transmitting stations 3-30 MHZ.* (i) Prior to grounding a radio transmitting station antenna, the employer shall insure that the rigger in charge:

(A) Prepares a danger tag signed with his signature,

(B) Requests the transmitting technician to shutdown the transmitter and to ground the antenna with its grounding switch,

(C) Is notified by the transmitting technician that the transmitter has been shutdown, and

(D) Tags the antenna ground switch personally in the presence of the transmitting technician after the antenna has been grounded by the transmitting technician.

(ii) Power shall not be applied to the antenna, nor shall the grounding switch be opened under any circumstances while the tag is affixed.

(iii) (A) Where no grounding switches are provided, grounding sticks shall be used, one on each side of line, and tags shall be placed on the grounding sticks, antenna switch, or plate power switch in a conspicuous place.

(B) When necessary to further reduce excessive radio frequency pickup, ground sticks or short circuits shall be placed directly on the transmission lines near the transmitter in addition to the regular grounding switches.

(C) In other cases, the antenna lines may be disconnected from ground and the transmitter to reduce pickup at the point in the field.

(iv) All radio frequency line wires shall be tested for pickup with an insulated probe before they are handled either with bare hands or with metal tools.

(v) The employer shall insure that the transmitting technician warn the riggers about adjacent lines which are, or may become energized.

(vi) The employer shall insure that when antenna work has been completed, the rigger in charge of the job returns to the transmitter, notifies the transmitting technician in charge that work has been

completed, and personally removes the tag from the antenna ground switch.

(n) *Overhead lines—(1) Handling suspension strand.* (i) The employer shall insure that when handling cable suspension strand which is being installed on poles carrying exposed energized power conductors, employees shall wear insulating gloves and shall avoid body contact with the strand until after it has been tensioned, dead-ended and permanently grounded.

(ii) The strand shall be restrained against upward movement during installation:

(A) On joint-use poles, where there is an upward change in grade at the pole, and

(B) On non-joint-use poles, where the line crosses under energized power conductors.

(2) *Need for testing wood poles.* Unless temporary guys or braces are attached, the following poles shall be tested in accordance with paragraph (n) (3) of this section and determined to be safe before employees are permitted to climb them:

(i) Dead-end poles, except properly braced or guyed "Y" or "T" cable junction poles,

(ii) Straight line poles which are not storm guyed and where adjacent span lengths exceed 165 feet,

(iii) Poles at which there is a downward change in grade and which are not guyed or braced corner poles or cable junction poles,

(iv) Poles which support only telephone drop wire, and

(v) Poles which carry less than ten communication line wires. On joint use poles, one power line wire shall be considered as two communication wires for purposes of this paragraph (n) (2) (v).

(3) *Methods for testing wood poles.* One of the following methods or an equivalent method shall be used for testing wood poles:

(i) Rap the pole sharply with a hammer weighing about 3 pounds, starting near the ground line and continuing upwards circumferentially around the pole to a height of approximately 6 feet. The hammer will produce a clear sound and rebound sharply when striking sound wood. Decay pockets will be indicated by a dull sound and/or a less pronounced hammer rebound. When decay pockets are indicated, the pole shall be considered unsafe. Also, prod the pole as near the ground line as possible using a pole prod or a screwdriver with a blade at least 5 inches long. If substantial decay is encountered, the pole shall be considered unsafe.

(ii) Apply a horizontal force to the pole and attempt to rock it back and forth in a direction perpendicular to the line. Caution shall be exercised to avoid causing power wires to swing together. The force may be applied either by pushing with a pike pole or pulling with a rope. If the pole cracks during the test, it shall be considered unsafe.

(4) *Unsafe poles or structures.* Poles or structures determined to be unsafe

by test or observation may not be climbed until made safe by guying, bracing or other adequate means. Poles determined to be unsafe to climb shall, until they are made safe, be tagged in a conspicuous place to alert and warn all employees of the unsafe condition.

(5) *Test requirements for cable suspension strand.* (i) Before attaching a splicing platform to a cable suspension strand, the strand shall be tested and determined to have strength sufficient to support the weight of the platform and the employee. Where the strand crosses above power wires or railroad tracks it may not be tested but shall be inspected in accordance with paragraph (n) (6) of this section.

(ii) The following method or an equivalent method shall be used for testing the strength of the strand: A rope, at least-eighths inch in diameter, shall be thrown over the strand. On joint lines, the rope shall be passed over the strand using tree pruner handles or a wire raising tool. If two employees are present, both shall grip the double rope and slowly transfer their entire weight to the rope and attempt to raise themselves off the ground. If only one employee is present, one end of the rope which has been passed over the strand shall be tied to the bumper of the truck, or other equally secure anchorage. The employee then shall grasp the other end of the rope and attempt to raise himself off the ground.

(6) *Inspection of strand.* Where strand passes over electric power wires or railroad tracks, it shall be inspected from an elevated working position at each pole supporting the span in question. The strand may not be used to support any splicing platform, scaffold or cable car, if any of the following conditions exist:

(i) Corrosion so that no galvanizing can be detected,

(ii) One or more wires of the strand are broken,

(iii) Worn spots, or

(iv) Burn marks such as those caused by contact with electric power wires.

(7) *Outside work platforms.* Unless adequate railings are provided, safety straps and body belts shall be used while working on elevated work platforms such as aerial splicing platforms, pole platforms, ladder platforms and terminal balconies.

(8) *Other elevated locations.* Safety straps and body belts shall be worn when working at elevated positions on poles, towers or similar structures, which do not have adequately guarded work areas.

(9) *Installing and removing wire and cable.* Before installing or removing wire or cable, the pole or structure shall be guyed, braced, or otherwise supported, as necessary, to prevent failure of the pole or structure.

(10) *Avoiding contact with energized power conductors or equipment.* When cranes, derricks, or other mechanized equipment are used for setting, moving, or removing poles, all necessary precautions shall be taken to avoid contact with energized power conductors or equipment.

(11) *Handling poles near energized power conductors.* (i) Joint use poles may not be set, moved, or removed where the nominal voltage of open electrical power conductors exceeds 34.5kV phase to phase (20kV to ground).

(ii) Poles that are to be placed, moved or removed during heavy rains, sleet or wet snow in joint lines carrying more than 8.7kV phase to phase voltage (5kV to ground) shall be guarded or otherwise prevented from direct contact with overhead energized power conductors.

(iii) (A) In joint lines where the power voltage is greater than 750 volts but less than 34.5kV phase to phase (20 kV to ground), wet poles being placed, moved or removed shall be insulated with either a rubber insulating blanket, a fiberglass box guide, or equivalent protective equipment.

(B) In joint lines where the power voltage is greater than 8.7 kV phase to phase (5kV to ground) but less than 34.5kV phase to phase (20 kV to ground), dry poles being placed, moved, or removed shall be insulated with either a rubber insulating blanket, a fiberglass box guide, or equivalent protective equipment.

(C) Where wet or dry poles are being removed, insulation of the pole is not required if the pole is cut off 2 feet or more below the lowest power wire and also cut off near the ground line.

(iv) Insulating gloves shall be worn when handling the pole with either hands or tools, when there exists a possibility that the pole may contact a power conductor. Where the voltage to ground of the power conductor exceeds 15kV to ground, Class II gloves (as defined in ANSI J6.6-1971) shall be used. For voltages not exceeding 15kV to ground, insulating gloves shall have a breakdown voltage of at least 17kV.

(v) The guard or insulating material used to protect the pole shall meet the appropriate 3 minute proof test voltage requirements contained in the ANSI J6.4-1971.

(vi) When there exists a possibility of contact between the pole or the vehicle-mounted equipment used to handle the pole, and an energized power conductor, the following precautions shall be observed:

(A) When on the vehicle which carries the derrick, avoid all contact with the ground, with persons standing on the ground, and with all grounded objects such as guys, tree limbs, or metal sign posts. To the extent feasible, remain on the vehicle as long as the possibility of contact exists.

(B) When it is necessary to leave the vehicle, step onto an insulating blanket and break all contact with the vehicle before stepping off the blanket and onto the ground. As a last resort, if a blanket is not available, the employee may jump cleanly from the vehicle.

(C) When it is necessary to enter the vehicle, first step onto an insulating blanket and break all contact with the ground, grounded objects and other persons before touching the truck or derrick.

(12) *Working position on poles.* Climbing and working are prohibited above the level of the lowest electric power conductor on the pole (exclusive of vertical runs and street light wiring), except:

(i) where communications facilities are attached above the electric power conductors, and a rigid fixed barrier is installed between the electric power facility and the communications facility, or

(ii) where the electric power conductors are cabled secondary service drops carrying less than 300 volts to ground and are attached 40 inches or more below the communications conductors or cables.

(13) *Metal tapes and ropes.* (i) Metal measuring tapes, metal measuring ropes, or tapes containing conductive strands may not be used when working near exposed energized parts.

(ii) Where it is necessary to measure clearances from energized parts, only nonconductive devices shall be used.

(o) *Underground lines.* The provisions of this paragraph apply to the guarding of manholes and street openings, and to the ventilation and testing for gas in manholes and unvented vaults, where telecommunications field work is performed on or with underground lines.

(1) *Guarding manholes and street openings.* (i) When covers of manholes or vaults are removed, the opening shall be promptly guarded by a railing, temporary cover, or other suitable temporary barrier which is appropriate to prevent an accidental fall through the opening and to protect employees working in the manhole from foreign objects entering the manhole.

(ii) While work is being performed in the manhole, a person with basic first aid training shall be immediately available to render assistance if there is cause for believing that a safety hazard exists, and if the requirements contained in paragraphs (d) (1) and (o) (1) (i) of this section do not adequately protect the employee(s). Examples of manhole worksite hazards which shall be considered to constitute a safety hazard include, but are not limited to:

(A) Manhole worksites where safety hazards are created by traffic patterns that cannot be corrected by provisions of paragraph (d) (1) of this section.

(B) Manhole worksites that are subject to unusual water hazards that cannot be abated by conventional means.

(C) Manhole worksites that are occupied jointly with power utilities as described in paragraph (o) (3) of this section.

(2) *Requirements prior to entering manholes and unvented vaults.* (i) Before an employee enters a manhole, the following steps shall be taken:

(A) The internal atmosphere shall be tested for combustible gas and, except when continuous forced ventilation is provided, the atmosphere shall also be tested for oxygen deficiency.

(B) When unsafe conditions are detected by testing or other means, the work area shall be ventilated and otherwise made safe before entry.

(ii) An adequate continuous supply of air shall be provided while work is performed in manholes under any of the following conditions:

(A) Where combustible or explosive gas vapors have been initially detected and subsequently reduced to a safe level by ventilation,

(B) Where organic solvents are used in the work procedure,

(C) Where open flame torches are used in the work procedure,

(D) Where the manhole is located in that portion of a public right of way open to vehicular traffic and/or exposed to a seepage of gas or gases, or

(E) Where a toxic gas or oxygen deficiency is found.

(iii) (A) The requirements of paragraphs (o) (2) (i) and (ii) of this section do not apply to work in central office cable vaults that are adequately ventilated.

(B) The requirements of paragraphs (o) (2) (i) and (ii) of this section apply to work in unvented vaults.

(3) *Joint power and telecommunication manholes.* While work is being performed in a manhole occupied jointly by an electric utility and a telecommunication utility, an employee with basic first aid training shall be available in the immediate vicinity to render emergency assistance as may be required. The employee whose presence is required in the immediate vicinity for the purposes of rendering emergency assistance is not to be precluded from occasionally entering a manhole to provide assistance other than in an emergency. The requirement of this paragraph (o) (3) does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, taking readings, or similar work if such work can be performed safely.

(4) *Ladders.* Ladders shall be used to enter and exit manholes exceeding 4 feet in depth.

(5) *Flames.* When open flames are used in manholes, the following precautions shall be taken to protect against the accumulation of combustible gas:

(i) A test for combustible gas shall be made immediately before using the open flame device, and at least once per hour while using the device; and

(ii) a fuel tank (e.g., acetylene) may not be in the manhole unless in actual use.

(p) *Microwave transmission.*—(1) *Eye protection.* Employers shall insure that employees do not look into an open waveguide which is connected to an energized source of microwave radiation.

(2) *Hazardous area.* Accessible areas associated with microwave communication systems where the electromagnetic radiation level exceeds the radiation protection guide given in § 1910.97 shall be posted as described in that section. The lower half of the warning symbol shall include the following:

Radiation in this area may exceed hazard limitations and special precautions are required. Obtain specific instruction before entering.

(3) *Protective measures.* When an employee works in an area where the electromagnetic radiation exceeds the radiation protection guide, the employer shall institute measures that insure that the employee's exposure is not greater than that permitted by the radiation guide. Such measures shall include, but not be limited to those of an administrative or engineering nature or those involving personal protective equipment.

(q) *Tree trimming—electrical hazards—(1) General.* (i) Employees engaged in pruning, trimming, removing, or clearing trees from lines shall be required to consider all overhead and underground electrical power conductors to be energized with potentially fatal voltages, never to be touched (contacted) either directly or indirectly.

(ii) Employees engaged in line-clearing operations shall be instructed that:

(A) A direct contact is made when any part of the body touches or contacts an energized conductor, or other energized electrical fixture or apparatus.

(B) An indirect contact is made when any part of the body touches any object in contact with an energized electrical conductor, or other energized fixture or apparatus.

(C) An indirect contact can be made through conductive tools, tree branches, trucks, equipment, or other objects, or as a result of communications wires, cables, fences, or guy wires being accidentally energized.

(D) Electric shock will occur when an employee, by either direct or indirect contact with an energized conductor, energized tree limb, tool, equipment, or other object, provides a path for the flow of electricity to a grounded object or to the ground itself. Simultaneous contact with two energized conductors will also cause electric shock which may result in serious or fatal injury.

(iii) Before any work is performed in proximity to energized conductors, the system operator/owner of the energized conductors shall be contacted to ascertain if he knows of any hazards associated with the conductors which may not be readily apparent. This rule does not apply when operations are performed by or on behalf of, the system operator/owner.

(2) *Working in proximity to electrical hazards.* (i) Employers shall ensure that a close inspection is made by the employee and by the foreman or supervisor in charge before climbing, entering, or working around any tree, to determine whether an electrical power conductor passes through the tree, or passes within reaching distance of an employee working in the tree. If any of these conditions exist either directly or indirectly, an electrical hazard shall be considered to exist unless the system operator/owner has caused the hazard to be removed by deenergizing the lines, or installing protective equipment.

(ii) Only qualified employees or trainees, familiar with the special techniques and hazards involved in line clearance, shall be permitted to perform the work

if it is found that an electrical hazard exists.

(iii) During all tree working operations aloft where an electrical hazard of more than 750V exists, there shall be a second employee or trainee qualified in line clearance tree trimming within normal voice communication.

(iv) Where tree work is performed by employees qualified in line-clearance tree trimming and trainees qualified in line-clearance tree trimming, the clearances from energized conductors given in Table R-3 shall apply.

TABLE R-3—Minimum working distances from energized conductors for line-clearance tree trimmers and line-clearance tree-trimmer trainees

Voltage range (phase to phase) (kilovolts)	Minimum working distance
2.1 to 15.0.....	2 ft. 0 in.
15.1 to 35.0.....	2 ft. 4 in.
35.1 to 46.0.....	2 ft. 6 in.
46.1 to 72.5.....	3 ft. 0 in.
72.6 to 121.0.....	3 ft. 4 in.
121.1 to 145.0.....	3 ft. 6 in.
145.1 to 169.0.....	3 ft. 8 in.
169.1 to 242.0.....	5 ft. 0 in.
242.1 to 362.0.....	7 ft. 0 in.
362.1 to 552.0.....	11 ft. 0 in.
552.1 to 765.0.....	15 ft. 0 in.

(v) Branches hanging on an energized conductor may only be removed using appropriately insulated equipment.

(vi) Rubber footwear, including line-man's overshoes, shall not be considered as providing any measure of safety from electrical hazards.

(vii) Ladders, platforms, and aerial devices, including insulated aerial devices, may not be brought in contact with an electrical conductor. Reliance shall not be placed on their dielectric capabilities.

(viii) When an aerial lift device contacts an electrical conductor, the truck supporting the aerial lift device shall be considered as energized.

(3) *Storm work and emergency conditions.* (i) Since storm work and emergency conditions create special hazards, only authorized representatives of the electric utility system operator/owner and not telecommunication workers may perform tree work in these situations where energized electrical power conductors are involved.

(ii) When an emergency condition develops due to tree operations, work shall be suspended and the system operator/owner shall be notified immediately.

(r) *Buried facilities—Communications lines and power lines in the same trench* [Reserved]

(s) *Definitions—(1) Aerial lifts* Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to jobsites above ground:

(i) Extensible boom platforms,

(ii) Aerial ladders,

(iii) Articulating boom platforms,

(iv) Vertical towers,

(v) A combination of any of the above defined in ANSI A92.2-1969. These de-

vices are made of metal, wood, fiberglass reinforced plastic (FRP), or other material; are powered or manually operated; and are deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.

(2) *Aerial splicing platform.* This consists of a platform, approximately 3 ft. x 4 ft., used to perform aerial cable work. It is furnished with fiber or synthetic ropes for supporting the platform from aerial strand, detachable guy ropes for anchoring it, and a device for raising and lowering it with a handline.

(3) *Aerial tent.* A small tent usually constructed of vinyl coated canvas which is usually supported by light metal or plastic tubing. It is designed to protect employees in inclement weather while working on ladders, aerial splicing platforms, or aerial devices.

(4) *Alive or live (energized).* 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 the place of the term "current-carrying," where the intent is clear, to avoid repetition of the longer term.

(5) *Barricade.* A physical obstruction such as tapes, cones, or "A" frame type wood and/or metal structure intended to warn and limit access to a work area.

(6) *Barrier.* A physical obstruction which is intended to prevent contact with energized lines or equipment, or to prevent unauthorized access to work area.

(7) *Bond.* An electrical connection from one conductive element to another for the purpose of minimizing potential differences or providing suitable conductivity for fault current or for mitigation of leakage current and electrolytic action.

(8) *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).

(9) *Cable sheath.* A protective covering applied to cables.

NOTE.—A cable sheath may consist of multiple layers of which one or more is conductive.

(10) *Circuit.* A conductor or system of conductors through which an electric current is intended to flow.

(11) *Communication lines.* The conductors and their supporting or containing structures for telephone, telegraph, railroad signal, data, clock, fire, police-alarm, community television antenna and other systems which are used for public or private signal or communication service, and which operate at potentials not exceeding 400 volts to ground or 750 volts between any two points of the circuit, and the transmitted power of which does not exceed 150 watts. When communications lines operate at less than 150 volts to ground, no limit is placed on the capacity of the system. Specifically designed communication cables may include communication circuits not complying with the preceding

limitations, where such circuits are also used incidentally to supply power to communication equipment.

(12) *Conductor*. A material, usually in the form of a wire, cable, or bus bar, suitable for carrying an electric current.

(13) *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 build-up of voltages which may result in undue hazard to connected equipment or to persons.

(14) *Equipment*. A general term which includes materials, fittings, devices, appliances, fixtures, apparatus, and similar items used as part of, or in connection with, a supply or communications installation.

(15) *Ground (reference)*. That conductive body, usually earth, to which an electric potential is referenced.

(16) *Ground (as a noun)*. A conductive connection, whether intentional or accidental, by which an electric circuit or equipment is connected to reference ground.

(17) *Ground (as a verb)*. The connecting or establishment of a connection, whether by intention or accident, of an electric circuit or equipment to reference ground.

(18) *Ground tent*. A small tent usually constructed of vinyl coated canvas supported by a metal or plastic frame. Its purpose is to protect employees from inclement weather while working at buried cable pedestal sites or similar locations.

(19) *Grounded conductor*. A system or circuit conductor which is intentionally grounded.

(20) *Grounded systems*. A system of conductors in which at least one conductor or point (usually the middle wire, or the neutral point of transformer or generator windings) is intentionally grounded, either solidly or through a current-limiting device (not a current-interrupting device).

(21) *Grounding electrode conductor*. (*Grounding conductor*). A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode.

(22) *Insulated*. Separated from other conducting surfaces by a dielectric substance (including air space) offering a high resistance to the passage of current.

NOTE.—When any object is said to be insulated, it is understood to be insulated in suitable manner for the conditions to which it is subjected. Otherwise, it is, within the purpose of these rules, uninsulated. Insulating coverings of conductors is one means of making the conductor insulated.

(23) *Insulation (as applied to cable)*. That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.

(24) *Joint use*. The sharing of a common facility, such as a manhole, trench or pole, by two or more different kinds of utilities (e.g., power and telecommunications).

(25) *Ladder platform*. A device designed to facilitate working aloft from

an extension ladder. A typical device consists of a platform (approximately 9' x 18') hinged to a welded pipe frame. The rear edge of the platform and the bottom cross-member of the frame are equipped with latches to lock the platform to ladder rungs.

(26) *Ladder seat*. A removable seat used to facilitate work at an elevated position on rolling ladders in telecommunication centers.

(27) *Manhole*. A subsurface enclosure which personnel may enter and which is used for the purpose of installing, operating, and maintaining submersible equipment and/or cable.

(28) *Manhole platform*. A platform consisting of separate planks which are laid across steel platform supports. The ends of the supports are engaged in the manhole cable racks.

(29) *Microwave transmission*. The act of communicating or signaling utilizing a frequency between 1 GHz (gigahertz) and 300 GHz, inclusively.

(30) *Nominal voltage*. The nominal voltage of a system or circuit is the value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. The actual voltage may vary above or below this value.

(31) *Pole balcony or seat*. A balcony or seat used as a support for workmen at pole-mounted equipment or terminal boxes. A typical device consists of a bolted assembly of steel details and a wooden platform. Steel braces run from the pole to the underside of the balcony. A guard rail (approximately 30" high) may be provided.

(32) *Pole platform*. A platform intended for use by a workman in splicing and maintenance operations in an elevated position adjacent to a pole. It consists of a platform equipped at one end with a hinged chain binder for securing the platform to a pole. A brace from the pole to the underside of the platform is also provided.

(33) *Qualified employee*. Any worker who by reason of his training and experience has demonstrated his ability to safely perform his duties.

(34) *Qualified line-clearance tree trimmer*. A tree worker who through related training and on-the-job experience is familiar with the special techniques and hazards involved in line clearance.

(35) *Qualified line-clearance tree-trimmer trainee*. Any worker regularly assigned to a line-clearance tree-trimming crew and undergoing on-the-job training who, in the course of such training, has demonstrated his ability to perform his duties safely at his level of training.

(36) *System operator/owner*. The person or organization that operates or controls the electrical conductors involved.

(37) *Telecommunications center*. An installation of communication equipment under the exclusive control of an organization providing telecommunications service, that is located outdoors or in a vault, chamber, or a building space used primarily for such installations.

NOTE.—Telecommunication centers are facilities established, equipped and arranged in

accordance with engineered plans for the purpose of providing telecommunications service. They may be located on premises owned or leased by the organization providing telecommunication service, or on the premises owned or leased by others. This definition includes switch rooms (whether electromechanical, electronic, or computer controlled), terminal rooms, power rooms, repeater rooms, transmitter and receiver rooms, switchboard operating rooms, cable vaults, and miscellaneous communications equipment rooms. Simulation rooms of telecommunication centers for training or developmental purposes are also included.

(38) *Telecommunications derricks*. Rotating or nonrotating derrick structures permanently mounted on vehicles for the purpose of lifting, lowering, or positioning hardware and materials used in telecommunications work.

(39) *Telecommunication line truck*. A truck used to transport men, tools, and material, and to serve as a traveling workshop for telecommunication installation and maintenance work. It is sometimes equipped with a boom and auxiliary equipment for setting poles, digging holes, and elevating material or men.

(40) *Telecommunication service*. The furnishing of a capability to signal or communicate at a distance by means such as telephone, telegraph, police and fire-alarm, community antenna television, or similar system, using wire, conventional cable, coaxial cable, wave guides, microwave transmission, or other similar means.

(41) *Unvented vault*. An enclosed vault in which the only openings are access openings.

(42) *Vault*. An enclosure above or below ground which personnel may enter, and which is used for the purpose of installing, operating, and/or maintaining equipment and/or cable which need not be of submersible design.

(43) *Vented vault*. An enclosure as described in paragraph (s) (42) of this section, with provision for air changes using exhaust flue stack(s) and low level air intake(s), operating on differentials of pressure and temperature providing for air flow.

(44) *Voltage of an effectively grounded circuit*. The voltage between any conductor and ground unless otherwise indicated.

(45) *Voltage of a circuit not effectively grounded*. The voltage between any two conductors. If one circuit is directly connected to and supplied from another circuit of higher voltage (as in the case of an autotransformer), both are considered as of the higher voltage, unless the circuit of lower voltage is effectively grounded, in which case its voltage is not determined by the circuit of higher voltage. Direct connection implies electric connection as distinguished from connection merely through electromagnetic or electrostatic induction.

§ 1910.274 [Redesignated]

7. Section 1910.268, *Sources of standards*, is redesignated as § 1910.274.

8. Section 1910.269, *Standards organizations*, is redesignated as § 1910.275, and is revised to read as follows:

RULES AND REGULATIONS

§ 1910.275 Standards organizations.

Specific standards of the following organizations have been referenced in this subpart. Copies of the referenced standards may be obtained from the issuing organizations. The names and addresses of the issuing organizations are as follows:

American National Standards Institute
(ANSI)
1430 Broadway
New York, New York 10018
National Fire Protection Association (NFPA)
470 Atlantic Avenue
Boston, Massachusetts 02210

American Society of Mechanical Engineers,
Inc., United Engineering Center
345 East 47th Street
New York, New York 10017
Institute of Makers of Explosives
420 Lexington Avenue
New York, New York 10017
Underwriters' Laboratories, Inc.
207 East Ohio Street
Chicago, Illinois 60611
American Society for Testing & Materials
(ASTM)
1916 Race Street
Philadelphia, Pennsylvania 19107

Effective date. Except as otherwise specifically provided, these amendments shall become effective on April 30, 1975.

(Secs. 6(b) and 8(c), Pub. L. 91-596, 84 Stat. 1593, 1599 (29 U.S.C. 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754); 29 CFR Part 1911)

Signed at Washington, D.C., this 20th day of March 1975.

JOHN STENDER,
Assistant Secretary of Labor.

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