

NESC SUBCOMMITTEE 8 WORK RULES
02 Oct, 2003 - 03 Oct, 2003
IEEE, Piscataway, NJ

Revised Text

Part: 4 Section: 41

Rule: 410 A2

CP2640

Subcommittee Recommendation: Reject

Subcommittee Comment:

Recommend the formation of a WG 8.11 to work on this issue.

January 13, 2004

WG reviewed the original CP and proposed modifications. The Subcommittee decided that the existing code language was appropriate. Also the SC believed that the CP and the modifications added an unnecessary layer of complexity.

Vote on Subcommittee Recommendation:

Affirmative: (17) Brooks, Brubaker, Erga, Fass, Grose, Henry, Hunt, McKinney, Mitchell, Poholski, Schweitzer, Spadafore, Theis, Tomaseski, Tootle, White, Woodings

Negative: (1) Doering

Abstention: (1) Kientz

Explanation of Vote:

DOERING: The NESC is overdue to have an approach distance to exposed energized facilities requirement for unqualified persons. The following was essentially my recommendation to WG 8.11, and I recommend their adoption. The proposed tables provide support to OSHA's 1910 Subpart S and NFPA 70E approach distance tables. Two limited approach distances are proposed, one for a worker with no conductive objects involved, and a second for when conductive objects are involved, such as tools, cranes, TV towers, etc. For the most part the proposal to replace "in the vicinity" with "within the limited approach distance" improves the document.

New Definition: limited approach boundary. An approach distance from exposed energized parts within which a shock hazard exists for unqualified persons. New Rule: 448. Limited Approach Boundary. The limited approach boundary is the minimum distance to exposed energized parts for unqualified persons. The boundary may be crossed by qualified communication persons (rule 430) or supply persons (rule 440).

A. Unqualified Persons' Limited Approach Boundary. All persons that do not meet the requirements for qualified shall not approach, or knowingly permit others to approach, energized parts closer than the distances specified in column 2 of Table 448-1. Work procedures, barricades, or barriers, shall be provided where an unqualified person could make unintentional contact with energized parts.

B. Limited Approach Boundary To Exposed Energized Parts For Conductive Objects In Contact With Unqualified Persons. Equipment such as dump bed trucks, cranes, augers, etc., operated by unqualified persons shall take appropriate precautions to assure that the operation of such equipment does not violate the limited approach boundary specified in column 3 of Table 448-1. Extension ladders, poles, antenna towers, long conductive tools, etc., shall be restrained or otherwise controlled so as not to violate the provisions of this paragraph. Work procedures, barricades, or barriers, shall be provided where an unqualified person in contact with a conductive tool or piece of equipment could make unintentional contact with energized parts.

Exception: Unqualified persons accompanied by and under the direct supervision of a qualified person, may cross the limited approach boundary in extreme situations where communications or supply persons do not possess the knowledge or skills to perform the specific task. The unqualified person shall be given instructions on approach distances and associated electrical hazards. The unqualified person shall repeat the instructions to the qualified person to the latter's satisfaction (see rule 421C).

C. Vehicular and Mechanical Equipment in Transit

1. Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that the limited approach boundary in Table 448-1, Column 3 is maintained; however, under any of the following conditions, the distance may be reduced:

a. If the vehicle is in transit with its structure lowered, the distance specified in Table 448-1, Column 3 may be reduced by 6 feet (1.83 m).

b. If insulating barriers are installed to prevent contact with the energized parts, and if the barriers are rated for the voltage of the energized part being guarded and are not a part of or an attachment to the vehicle or its raised

structure, the distance may be reduced to a distance within the designed working dimensions of the insulating barrier.

c. If the equipment is an aerial device insulated for the voltage involved, and if the work is performed by a qualified person, the distance (between the uninsulated portion of the aerial device and the energized part) may be reduced to the distance of rule 431 for communications employees or rule 441 for supply employees.

2. Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:

a. The employee is using protective equipment rated for the phase-to-ground voltage; or

b. The vehicle or equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path for persons on the ground) can come closer to the line than permitted in Table 448-1, Column 3.

3. If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of energized part contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous step, touch, and transfer voltages within 3 m (10 ft) of any extremity of the grounding point or grounded object.

Table 448-1

_____ Limited Approach Distance To Exposed Energized Parts _____
 _____ (See Rule 448 in its entirety.) _____

Nominal System _____ Limited Approach Boundaries _____
 Voltage Range, _____ Distance From Person To _____ Distance From Long
 Phase to Phase _____ Exposed Energized Circuit _____ Conductive Object
 _____ Part 1 _____ (In Contact With Person)
 _____ To Exposed Energized Part

Column 1	Column 2	Column 3
0 to 50 Volts	Not Specified	Not Specified
51 to 300 Volts	3 ft 6 in	1.07 m
301 to 750 Volts	3 ft 6 in	1.07 m
751 Volts to 15 kV	5 ft 0 in	1.53 m
15.1 kV to 36 kV	6 ft 0 in	1.83 m
36.1 kV to 46 kV	8 ft 0 in	2.44 m
46.1 kV to 72.5 kV	8 ft 0 in	2.44 m
72.6 kV to 121 kV	8 ft 0 in	2.44 m
121 kV to 145 kV	10 ft 0 in	3.05 m
145 kV to 169 kV	11 ft 8 in	3.56 m
169 kV to 242 kV	13 ft 0 in	3.97 m
242 kV to 362 kV	15 ft 4 in	4.68 m
362 kV to 550 kV	19 ft 0 in	5.80 m
550 kV to 800 kV	23 ft 9 in	7.24 m

Note 1 If energized part is a movable conductor, increase the distance to allow for swing in direction of person or held object.

Source/Justification for table clearances:

The voltage ranges shown in Column 1 are the same as used by OSHA in 1910.269, as well as in IEEE Std 516. The source for the Column 2 distances are as follows:

0 - 750 volts, based on NEC Table 110-26(a) Working Clearances Condition 2 for 151-600V.

751 Volts to 145 kV, based on values in NEC Table 110-34(a) Working Clearances Condition 2.

The source for the Column 3 distances are based on the following distances:

(1) For voltages to ground 50 kV or below B 10 ft.

(2) For voltages to ground over 50 kV B 10 ft. plus 4 in. For every 10 kV over 50 kV.

This is the OSHA 10 ft rule provisions. OSHA's 10 ft rule appeared in their standards as early as October 1972. It is believed that OSHA took their 10 ft rule from the Crawler, Locomotive, and Truck Cranes USA Standard B30.5-1968, as it essentially reads the same as in their original crane standard 1910.181(j)(5). These values have worked for 35 years, so they are okay.