

## Are Insulated Cables Live Parts?

### Summary

Insulated cables operating at less than 600 Volts are not “live parts” and as such are not covered by OSHA 1910.303(g)(2), NFPA 70 Article 110.27 and NFPA 70E Article 400.16. Insulated cable operating above 600 volts are considered “live parts” and are covered by OSHA 1910.303(h), NFPA 70 Article 110.31 and NFPA 70E Article 400.17 and must be guarded.

### Relevant Codes Sections

#### **OSHA 1910.303 (g) Guarding of live parts.**

##### **1910.303(g)(2)(i)**

Except as required or permitted elsewhere in these subpart, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by approved cabinets or other forms of approved enclosures, or by any of the following means:

##### **1910.303(g)(2)(i)(A)**

By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

##### **....1910.303(g)(2)(i)(B)**

##### **1910.303(g)(2)(i)(B)**

By suitable permanent, substantial partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

##### **1910.303(g)(2)(i)(C)**

By location on a suitable balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.

##### **1910.303(g)(2)(i)(D)**

By elevation of 8 feet or more above the floor or other working surface.

#### **NFPA 70E Article 400.16 Guarding of Live Parts. (Reads exactly the same as NFPA 70 Article 110.27)**

(A) Live Parts Guarded Against Accidental Contact. Except as elsewhere required or permitted by this standard, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by approved enclosures or by any of the following means:

- (1) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

## Interpretation of the Electrical Safety Committee – December 2005

- (2) By suitable permanent, substantial partitions or screens arranged so that only qualified persons have access to the space within reach of the live parts. Any openings in such partitions or screens shall be sized and located so that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.
- (3) By location on a suitable balcony, gallery, or platform elevated and arranged so as to exclude unqualified persons.
- (4) By elevation of 2.5 m (8 ft) or more above the floor or other working surface.

### Discussion / Analysis

OSHA and the NFPA have made a clear distinction in that 600 Volts is the threshold at which an insulated cable must be considered a “live part”. While no specific definition can be found, if this were not true then one would have to consider every 120 volt cord and protect it, in addition every room containing a cable operating under 600 volts would have to be labeled as containing “live parts”. This would encompass almost every room at BNL and else where in the USA.

Some confusion did originally exist in that in OSHA 1910.303(g)(1) Table S-1 a note indicated as follows:

*Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts*

From this note the converse would be that insulated wire operating at or over 300 volts would be considered a live part. This confusion was cleared up by OSHA in their interpretation letter to Mr. Marvin B. Moore of ExxonMobile dated July 1,2005 where they state:

*Specifically, the statement that Note 2, to Table S-1-- WORKING CLEARANCE, applies to paragraph 1910.303(g)(2), is being stricken as it is inconsistent with the provisions of the standard. (See page three of the attached letter.) This note only applies to the working clearance provisions contained in §1910.303(g)(1) and not to the (g)(2) provisions for guarding live parts.*

This clearly indicates that the 300V threshold does not apply to 1910.303(g)(2).

### Review By Others

To further support our interpretation, the LESC posed this on code forums and discussed this with industry experts as follows:

#### Discussion at the DOE November 2005 Electrical Safety Committee Meeting

This issue was presented in general session at the DOE Electrical Safety Committee meeting. This meeting is attended by DOE-EH, representatives from most sites some of which are members of the NFPA 70 and 70E code panels, and invited industry electrical safety experts. The clear consensus was in agreement with the BNL LESC interpretation that insulated cables operations under 600V are not live parts.