Errata

NFPA 70®
National Electrical Code® (Report on Proposals)

Proposed 2014 Edition

Reference: 12-109 (Log #1618) Panel Meeting Action

The National Electrical Code Technical Correlating Committee notes the following error in the ROP on NFPA 70®, National Electrical Code®.

1. Proposal 12-109 starting on page 675 of the ROP has missing text in the panel action. Shown below is the proposal with the panel action as it should have been published.

Report on Proposals – June 2013

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Final Action: Accept in Principle

Panel Meeting Action: Combining the following panel actions:
yields a revised Article 645 that reads as follows:

ARTICLE 645
Information Technology Equipment

Informational Note: Text that is followed by a reference in brackets has been extracted from NFPA 75-2009, Standard for the Protection of Information Technology Equipment. Only editorial changes were made to the extracted text to make it consistent with this Code.

I. General

645.1 Scope. This article covers equipment, power-supply wiring, equipment interconnecting wiring, and grounding of information technology equipment and systems in an information technology equipment room.

Informational Note: For further information, see NFPA 75-2009, Standard for the Protection of Information Technology Equipment, which covers the requirements for the protection of information technology equipment and information technology equipment areas.

645.2 Definitions.
Abandoned Supply Circuits and Interconnecting Cables. Installed supply circuits and interconnecting cables that are not terminated at equipment and not identified for future use with a tag.

Critical Operations Data System. An information technology equipment system that requires continuous operation for reasons of public safety, emergency management, national security, or business continuity.

Information Technology Equipment (ITE). Equipment and systems rated 600 volts or less, normally found in offices or other business establishments and similar environments classified as ordinary locations, that are used for creation and manipulation of data, voice, video, and similar signals that are not communications equipment as defined in Part I of Article 100 and do not process communications circuits as defined in 800.2.

Information Technology Equipment Room. A room within the information technology equipment area that contains the information technology equipment. [75:3.3.9]

Remote Disconnect Control. An electric device and circuit that controls a disconnecting means through a relay or equivalent device.
Zone. A physically identifiable area (such as barriers or separation by distance) within an information technology equipment room, with dedicated power and cooling systems for the information technology equipment or systems.

645.3 Other Articles. Circuits and equipment shall comply with 645.3(A) through (H), as applicable.

(A) Spread of Fire or Products of Combustion. Sections 300.21, 770.26, 800.26, and 820.26 shall apply to penetrations of the fire-resistant room boundary.

(B) Plenums. The provisions of 300.22(C)(1), 725.154(A), 760.53(B)(2), 760.154(A), 770.113(C), 800.113(C), and 820.113(C) and Tables 770.154(A), 800.154(A) and 820.154(A) shall apply to wiring and cabling in a plenum (other space used for environmental air) above an information technology equipment room.

(C) Grounding. The non–current-carrying conductive members of optical fiber cables in an information technology equipment room shall be grounded in accordance with 770.114.

(D) Electrical Classification of Data Circuits. The provisions of 725.121(A)(4) shall apply to the electrical classification of listed information technology equipment signaling circuits. The provisions of 725.139(D)(1) and 800.133(A)(1)(b) shall apply to the electrical classification of Class 2 and Class 3 circuits in the same cable with communications circuits.

(E) Fire Alarm Equipment. Parts I, II, and III of Article 760 shall apply to fire alarm systems equipment installed in an information technology equipment room.

(F) Communications Equipment. Parts I, II, III, IV, and V of Article 800 shall apply to communications equipment installed in an information technology equipment room. Article 645 shall apply to the powering of communications equipment in an information technology equipment room.

   Informational Note: See Part I of Article 100, Definitions, for a definition of communications equipment.

(G) Community Antenna Television and Radio Distribution Systems Equipment. Parts I, II, III, IV, and V of Article 820 shall apply to community antenna television and radio distribution systems equipment installed in an information technology equipment room. Article 645 shall apply to the powering of community antenna television and radio distribution systems equipment installed in an information technology equipment room.

(H) Cables Not in Information Technology Equipment Room. Cables extending beyond the information technology equipment room shall be subject to the applicable requirements of this Code.

645.4 Special Requirements for Information Technology Equipment Room. This article shall be permitted to provide alternate wiring methods to the provisions of Chapters 1 through 4 for power wiring, Parts I & III of Article 725 for signaling wiring and Parts I & V of Article 770 for optical fiber cabling when all of the following conditions are met:

1. Disconnecting means complying with 645.30 are provided.
2. A heating/ventilating/air-conditioning (HVAC) system is provided in one of the methods identified in 645.4(2)(a) or (b).
   a. a separate HVAC system that is dedicated for information technology equipment use and is separated from other areas of occupancy
   b. an HVAC system that serves other occupancies and:
      1. also serves the information technology equipment room; and
      2. provides fire/smoke dampers at the point of penetration of the room boundary; and
      3. activates the damper operation upon initiation by smoke detector alarms, by operation of the disconnecting means required by 645.30, or both.

Exception: Where information technology equipment is installed in a critical operations data system in compliance with 645.10(B), a procedure shall be permitted that controls the cessation of the air circulation within the room or zone.

   Informational Note: For further information, see NFPA 75-2009, Standard for the Protection of Information Technology Equipment, Chapter 10, 10.1, 10.1.1, 10.1.2, and 10.1.3.

3. All information technology and communications equipment installed in the room is listed.
4. The room is occupied by, and accessible to, only those personnel needed for the maintenance and functional operation of the installed information technology equipment.
5. The room is separated from other occupancies by fire-resistant-rated walls, floors, and ceilings with protected openings.

   Informational Note: For further information on room construction requirements, see NFPA 75-2009, Standard for the Protection of Information Technology Equipment, Chapter 5.
(6) Only electrical equipment and wiring associated with the operation of the information technology room is installed in the room.

Informational Note: HVAC systems, communications systems, and monitoring systems such as telephone, fire alarm systems, security systems, water detection systems, and other related protective equipment are examples of equipment associated with the operation of the information technology room.

(7) If a raised floor is present, the raised floor is of approved construction, and the area under the floor is accessible.
(8) If a raised floor in present, ventilation in the underfloor area is used for the information technology equipment room only, except as provided in 645.4(2). The ventilation system shall also be so arranged, with approved smoke detection devices, that upon the detection of fire or products of combustion in the underfloor space, the circulation of air will cease.
(9) If a raised floor is present, openings for cords and cables protect cords and cables against abrasion and minimize the entrance of debris beneath the floor.

645.13 Physical Protection. Where exposed to physical damage, supply circuits and interconnecting cables shall be protected.

645.14 Securing in Place. Power cables; communications cables; connecting cables; interconnecting cables; and associated boxes, connectors, plugs, and receptacles that are listed as part of, or for, information technology equipment shall not be required to be secured in place.

645.15 Grounding. All exposed non–current-carrying metal parts of an information technology system shall be bonded to the equipment grounding conductor or shall be double insulated. Where signal reference structures are installed, they shall be bonded to the equipment grounding conductor provided for the information technology equipment. Any auxiliary grounding electrode(s) installed for information technology equipment shall be installed in accordance with Section 250.54.

Informational Note: The bonding requirements in the product standards governing this listed equipment ensure that it complies with Article 250.

645.16 Marking. Each unit of an information technology system supplied by a branch circuit shall be provided with a manufacturer’s nameplate, which shall also include the input power requirements for voltage, frequency, and maximum rated load in amperes.

645.18 Abandoned Supply Circuits and Interconnecting Cables. The accessible portion of abandoned supply circuits and interconnecting cables shall be removed unless contained in a raceway.

645.19 Installed Supply Circuits and Interconnecting Cables Identified for Future Use.

(1) Supply circuits and interconnecting cables identified for future use shall be marked with a tag of sufficient durability to withstand the environment involved.
(2) Supply circuit tags and interconnecting cable tags shall have the following information:

a. Date identified for future use

b. Date of intended use

c. Information relating to the intended future use

II. Power Circuits

645.20 Uninterruptible Power Supplies (UPSs). Except for installations and constructions covered in 645.20(1) or (2), UPS systems installed within the information technology equipment room, and their supply and output circuits, shall comply with 645.30. The disconnecting means shall also disconnect the battery from its load.

(1) Installations qualifying under the provisions of Article 685

(2) Power sources limited to 750 volt-amperes or less derived either from UPS equipment or from battery circuits integral to electronic equipment

645.21 Power Distribution Units. Power distribution units that are used for information technology equipment shall be permitted to have multiple panelboards within a single cabinet, if the power distribution unit is utilization equipment listed for information technology application.
645.22 Power Systems Grounding. Power systems derived within listed information technology equipment that supply information technology systems through receptacles or cable assemblies supplied as part of this equipment shall not be considered separately derived for the purpose of applying 250.30

   Informational Note: Where isolated grounding-type receptacles are used, see 250.146(D) and 406.3(D).

645.23 Selective Coordination. Critical Operations Data System(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent protective devices.

645.25 Engineering Supervision. As an alternative to the feeder and service load calculations required by Parts III and IV of Article 220, feeder and service load calculations for new or existing loads shall be permitted to be used if provided by qualified persons under engineering supervision.

645.26 Branch-Circuit Conductors. The branch-circuit conductors supplying one or more units of information technology equipment shall have an ampacity not less than 125 percent of the total connected load.

645.27 Power-Supply Cords. Information technology equipment shall be permitted to be connected to a branch circuit by a power-supply cord.

   (1) Power-supply cords shall not exceed 4.5 m (15 ft).

   (2) Power cords shall be listed and a type permitted for use on listed information technology equipment or shall be constructed of listed flexible cord and listed attachment plugs and cord connectors of a type permitted for information technology equipment.

   Informational Note: One method of determining if cords are of a type permitted for the purpose is found in UL 60950-1-2007, Safety of Information Technology Equipment - Safety - Part 1: General Requirements.

645.28 Interconnecting Cables. Separate information technology equipment units shall be permitted to be interconnected by means of listed cables and cable assemblies. The 4.5 m (15 ft) limitation in 645.27(1) shall not apply to interconnecting cables.

645.29 Under Raised Floors. Power cables, connecting cables, interconnecting cables, cord-and-plug connections, and receptacles associated with the information technology equipment installed under a raised floor shall comply with (1) through (4):

   (1) The branch-circuit supply conductors to receptacles or field-wired equipment are in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, electrical metallic tubing electrical nonmetallic tubing, metal wireway, nonmetallic wireway, surface metal raceway with metal cover, surface nonmetallic raceway, flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit, Type MI cable, Type MC cable, or Type AC or Type TC cable and associated metallic and nonmetallic boxes or enclosures. These supply conductors shall be installed in accordance with the requirements of 300.11.

   (2) Supply cords of listed information technology equipment in accordance with 645.27 shall be permitted.

   (3) Interconnecting cables shall be enclosed in a raceway.

   (4) Equipment grounding conductors.

645.30 Disconnecting Means. An approved means shall be provided to disconnect power to all electronic equipment in the information technology equipment room or in designated zones within the room. There shall also be a similar approved means to disconnect the power to all dedicated HVAC systems serving the room or designated zones and shall cause all required fire/smoke dampers to close. The installation of remote disconnect controls shall be in accordance with (A) through (B).

   Exception No. 1: Installations qualifying under the provisions of Article 685.

(A) Remote Disconnect Controls.

   (1) Remote disconnect means shall be located at approved locations readily accessible in case of fire to authorized personnel and emergency responders.

   (2) The remote disconnect controls for the control of electronic equipment power and HVAC systems shall be grouped and identified. A single means to control both systems shall be permitted.

   (3) Where multiple zones are created, each zone shall have an approved means to confine fire or products of combustion to within the zone.

   (4) Additional means to prevent unintentional operation of remote disconnect controls shall be permitted.

   Informational Note: For further information, see NFPA 75-2009, Standard for the Protection of Information Technology Equipment.
(B) Critical Operations Data Systems. Remote disconnecting controls shall not be required for critical operations data systems when all of the following conditions are met:

1. An approved procedure has been established and maintained for removing power and air movement within the room or zone.
2. Qualified personnel are continuously available to meet emergency responders and to advise them of disconnecting methods.
3. A smoke-sensing fire detection system is in place.

   Informational Note: For further information, see NFPA 72-2010, National Fire Alarm and Signaling Code.

4. An approved fire suppression system suitable for the application is in place.
5. Signal wiring under a raised floor is in compliance with 645.32.

III. Signaling Circuits

645.31 Under Raised Floors- General. The following wiring cables shall be permitted:

1. Cable type designations shown in Table 645.31
2. Type DP cable having adequate fire-resistant characteristics suitable for use under raised floors of an information technology equipment room.

   Informational Note No.1: One method of defining fire resistance is by establishing that the cables do not spread fire to the top of the tray in the “UL Flame Exposure, Vertical Tray Flame Test” in UL 1685-2000, Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables. The smoke measurements in the test method are not applicable.

   Another method of defining fire resistance is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the CSA “Vertical Flame Test — Cables in Cable Trays,” as described in CSA C22.2 No. 0.3-M- 2001, Test Methods for Electrical Wires and Cables.

   Informational Note No.2: Informational Note: For information on listing requirements for communications raceways and cable routing assemblies, see UL 2024-2011, Signaling, Optical Fiber and Communications Raceways and Cable Routing Assemblies.

3. Listed interconnecting cables, enclosed in a raceway, that interconnect separate information technology equipment units.

   Renumber Table 645.5 to 645.31

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645.32 Under Raised Floors in a Critical Operations Data System. Signal wiring under a raised floor in a critical operations data system shall be in compliance with 300.22(C), 725.154(A), 770.113(C) and Table 770.154(a), 800.113(C) and Table 800.154(a), or 820.113(C) and Table 820.154(a).

Issue Date: July 11, 2012