REPORT OF RESEARCH

ON

ELECTRICAL METALLIC TUBING
FOR USE OVER 600 VOLTS

JANUARY 19, 1996

UNDERWRITERS LABORATORIES INC.
NORTHBROOK, IL 60062

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Report on
Electrical Metallic Tubing for Use Over 600 Volts

January 19, 1996

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INTRODUCTION

Electrical metallic tubing (EMT) is an electrical raceway, intended to be used with appropriate fittings for the routing of electrical conductors between electrical enclosures or equipment enclosures, in accordance with the National Electrical Code® (NEC®). EMT is sometimes referred to as “thin-wall conduit”.

The purpose of this report is to provide technical information regarding the use of EMT in applications where the voltage between circuit conductors or between conductors and ground is over 600 volts. This work is not an interpretation of the NEC®. Unless indicated otherwise, all references to the NEC® are to the 1996 Edition.

Included in this work are the appropriate NEC® references, historical information, comparisons with other raceways systems specified by the NEC® as suitable for use with circuits rated over 600 volts, and information regarding the Underwriters Laboratories Listing evaluations for EMT and associated fittings.

Based on the technical information presented herein, and the absence of a prohibition in the NEC® regarding the use of EMT in applications over 600 volts, Underwriters Laboratories has identified EMT as suitable for use where the voltage between circuit conductors or between conductors and ground is over 600 volts. Use of "other identified raceways" in such applications is permitted by Section 710-4(a) of the NEC®.
EMT Used as Equipment Grounding Conductor:

In accordance with Section 250-91(b) of the NEC®, EMT is permitted to serve as an equipment grounding conductor. Sections 110-10 and 250-51 require an effective grounding path in order to facilitate the operation of the overcurrent protective device in the event of a fault. Section 710-7 specifies that wiring and equipment for over 600 volts is to be grounded in accordance with the applicable provisions of Article 250.

Effective in February 1996, UL 514B, the Standard for Safety for Fittings for Conduit and Outlet Boxes [3] will require all EMT fittings to be subjected to a Current Test. This test is conducted at a specified current for a given period of time. The purpose of the test is to determine if the EMT and the interface between the EMT and the fitting can effectively carry fault current, in order to permit operation of the overcurrent device and terminate fault current flow. The test current and time are from UL 467, the Standard for Safety for Grounding and Bonding Equipment [4].

Testing conducted on the fittings is not dependent on the system voltage (over or under 600 volts) between circuit conductors or between conductors and ground. The testing is conducted using test equipment that permits the applied voltage to fluctuate, with the resultant voltage applied being that necessary to result in a constant current for the specified time.

Over time, environmental conditions may have a detrimental effect on the interface between the raceway and the associated fittings. As corrosion increases the resistance at this interface, it would be expected that a higher circuit voltage would have a greater capability to facilitate a current path across the interface. This would permit the fault current to return to the source and result in the operation of the overcurrent device.

The IAEI Soares Book on Grounding [5] publishes tables specifying the maximum lengths of rigid metal conduit (RMC) and EMT that are recommended to be used as an equipment grounding conductor. The values given are considered to be the maximum system length that would be capable of carrying fault current to facilitate the operation of the overcurrent device. These tables assume a specified clearing ground-fault current and voltage drop at the point of the fault.
With sponsorship by the National Electrical Manufacturers Association (NEMA), a computer model was developed at the Georgia Tech Research Institute [6]. The purpose of the work was to evaluate the grounding capabilities of electric power installations, to determine their capabilities to provide protection in the event of faults, and to reduce the risk of electric shock. It was also intended to confirm the maximum system lengths specified in the Soares Book.

The computer model was developed based on the resistivity and permeability of steel conduit, as functions of magnetic field density and temperature. Resistivity and permeability values for the conduit material, as published, were verified using 2-3 inch lengths of RMC, intermediate metal conduit (IMC), and EMT. To validate the model developed, 10 runs of conduit, each 256 feet in length, were tested. Resistance and inductance values recorded were compared to the model prediction.

The following table shows the comparison between RMC, IMC, and EMT, based on the computer model. For this table, a circuit of 120 volts to ground, with a 40-volt drop at the point of the fault is assumed. For specified overcurrent protective device ratings in all trade sizes, the computer model shows that the EMT maximum length is equal to or greater than the maximum length for RMC or IMC. For higher circuit voltages, the calculated maximum lengths would be greater, based on the conduit impedance (note the last line in the table).

The computer calculation for maximum system length assumes a standard operating temperature of 25°C. All values in the following table are based on this operating temperature. As the operating temperature is increased to 75°C, the maximum length of run for RMC, IMC, and EMT exhibits a comparable decrease from the values shown.
### Maximum System Length (Predicted by Model - 40 Volt Arc and 400% of Protective Device Rating)

<table>
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<tr>
<th>Trade Size</th>
<th>Conductor Size, AWG/kcmil</th>
<th>Overcurrent Device Rating, Amps 75°C</th>
<th>Fault Clearing Current — 400% of Overcurrent Device Rating</th>
<th>RMC Maximum Length Run, Feet+</th>
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* Run lengths based on computer model SCA V1.3, developed at Georgia Institute of Technology. Project sponsored by NEMA.
* Circuit at 7200 volts to ground.
OTHER RACEWAYS OR SYSTEMS USED OVER 600 VOLTS

NEC® Section 600-31(a):

For neon secondary circuit conductors of 1000 volts, nominal, or less, this Section permits conductors for electric signs and outline lighting to be installed using any wiring method included in Chapter 3 that provides a means for equipment grounding. As a Chapter 3 wiring method, EMT is permitted for use in circuits over 600 volts.

NEC® Section 334-2:

Type MC cable is permitted for systems in excess of 600 volts, nominal. UL 1569, the Standard for Metal-Clad Cables [7], specifies the minimum strip thickness for the armor to be 0.017 or 0.022-inch, depending on the cable diameter. Wall thickness for EMT varies by size and the minimum is 0.042 inches.

NEC® Section 430-123:

This Section permits flexible metal conduit or liquidtight flexible metal conduit (LFMC) not exceeding 6 feet (1.83 m) in length to be employed for raceway connection to a motor terminal enclosure, for circuits over 600 volts.

UL 360, the Standard for Liquid-Tight Flexible Steel Conduit [8] specifies that LFMC is intended for use as a raceway for wires and cables in motor circuits operating at potentials over 600 volts [NEC® 430-123], in electric sign circuits operating at potentials up through 1000 volts [NEC® 600-31(a)] and over 1000 volts [NEC® 600-32(a)]. LFMC for use above 600 volts is subjected to the same evaluation and testing as LFMC for use at less than 600 volts.

LFMC is circular in cross section, having an outer liquidtight, nonmetallic, sunlight resistant jacket over an inner flexible metal core. This raceway, in the trade sizes 3/8 through 1-1/4 inch, is provided with a bonding strip wound throughout the entire length of the conduit. For UL Listing, these sizes must comply with the Fault-Current Test, conducted using an adjustable, nominal 600 volt, ac supply circuit.

Section 351-9 of the NEC® restricts the use of LFMC for grounding to lengths not exceeding 6 feet. The length of EMT used as the equipment grounding conductor is not limited by the NEC®.
**NEC® Section 600-32(a):**

For neon secondary circuit conductors over 1000 volts, nominal, this Section permits conductors for electric signs and outline lighting to be installed in:

- Rigid metal conduit,
- Intermediate metal conduit,
- Rigid nonmetallic conduit,
- Liquidtight flexible nonmetallic conduit,
- Flexible metal conduit,
- Liquidtight flexible metal conduit,
- **Electrical metallic tubing,** or
- Electrical nonmetallic tubing.

**NEC® Section 710-4:**

**Rigid Metal Conduit**

UL 6, the Standard for Rigid Metal Conduit [9], covers conduit made from steel, wrought iron, silicon-bronze alloy, aluminum alloy containing not more than 0.40 percent copper, or other metal subject to an investigation. The requirements include a Bending Test, Preece Test, and dimensions for the acceptable radius and straight length of elbows and bends.

Similarly, EMT is required to be constructed of steel, aluminum alloy not more than 0.40 percent copper, or other metal subject to an investigation. The Bending Test, Preece Test, and dimensions for the acceptable radius and straight length of elbows and bends are the same as for rigid metal conduit.

**Intermediate Metal Conduit**

IMC was added to the NEC® in the 1975 Edition. Substantiation for the proposal to add IMC was a UL Fact-Finding Report dated November 27, 1972 and a Supplemental Report dated October 4, 1973. Comparative arcing tests were conducted on IMC, rigid steel conduit, aluminum conduit, and EMT.

The testing was conducted with an electric arc welder using 200, 250, and 300 ampere settings and a 1/4-inch steel welding rod. The tests were conducted at the output voltage of the electric welder, which would typically be less than 100 volts. The burn-through times for IMC, aluminum conduit, and EMT were all significantly shorter than for rigid steel conduit.
Shortly after the 1975 NEC® was issued, a Tentative Interim Amendment (TIA) was requested to add IMC into Article 710. The submitter asserted that an error had occurred in overlooking the addition of IMC to Article 710 by the NEC® Correlating Committee, at the time IMC was accepted for Article 345. The TIA was approved without further technical substantiation.

**Rigid Nonmetallic Conduit (RNC)**

RNC was added to the NEC® in the 1978 Edition for underground use, and in the 1981 Edition for aboveground use. Comparison arcing tests have been conducted on rigid PVC conduit and EMT, using an artificially prepared fault in the interior of the conduit or tubing. Testing was conducted at 480 volts, 230 amps, using No. 8 solid copper or aluminum conductors.

Direct comparisons cannot be made, due to the variability of the arc duration reported. However, results for the rigid PVC conduit ranged from “no damage” to “complete burn-through”. For the EMT, results ranged from “no damage” to “pin-hole burn-through”. The testing conducted was further indication that performance of various raceways under arcing conditions is not voltage dependent.

**Type MV Cable**

The 1990 Edition of the NEC® was revised to permit open runs of Type MV cables in locations accessible to qualified persons only. No technical substantiation was considered necessary, as Type MV cables are identified for the application.

Type MV cables may be shielded or nonshielded, rated 5,000 to 35,000 volts. They are single or multiple conductor, aluminum or copper, with solid extruded dielectric insulation and may have an extruded jacket. Type MV cables are also permitted to be installed in raceways, cable trays, or directly buried.

Type MV conductors have a larger diameter and are not as pliant as the equivalent gauge size Type RHW conductors, also used for applications over 600 volts. To facilitate pulling of Type MV cables in raceway, they are typically installed in raceway of a trade size larger than that required by the wire-fill requirements in the NEC®. In addition, long sweep elbows are commonly used to change the direction of the raceway.
FITTINGS

- Appropriate fittings are necessary to complete a raceway system. The fittings are used to connect the raceway to an electrical enclosure, or to connect adjacent raceway sections together. UL does not assign a voltage rating to raceway fittings.

- RMC is specifically permitted by the NEC® in Article 710 for applications over 600 volts. RMC in the 2-1/2 through 4 inch trade sizes has the same outside diameter as EMT. For these trade sizes, some manufacturer's threadless connectors and couplings are UL Listed for use with RMC and EMT.

- Where RMC and IMC are cut in the field, threadless fittings are commonly used. Threadless fittings for RMC, IMC, and EMT are subjected to essentially the same investigation for UL Listing in accordance with UL 514B. The Bending Test loading is heavier for RMC and IMC fittings, due to the heavier weight of a conduit length. After the Bending Test, a Pullout Test is performed. The Pullout test values are the same for RMC, IMC, and EMT.

- Type MC cable is UL Listed for up to 2000 volts. Fittings for use with cable rated over 600 volts are subjected to the same evaluation and testing as fittings for use with cable rated at less than 600 volts.

- Fittings for RNC, permitted by NEC® Section 710-4 to be used over 600 volts, are subjected to the same evaluation and testing as fittings for use with RNC at less than 600 volts.
SUMMARY

Over the years, the NEC® Code Making Panels have evaluated numerous different types of raceway systems for various applications, above and below 600 volts. Many raceway systems were accepted based on satisfactory field performance, while others were accepted based on comparisons of certain mechanical or electrical properties to systems that have demonstrated satisfactory performance. For raceway systems specified by the NEC® for over 600 volt applications, acceptance is not based on a specified mechanical or electrical property level, but on assessment of the overall performance of the system. The information in this report substantiates identification of EMT as suitable for use with circuits rated above and below 600 volts.

EMT has been accepted by AHJ's for routing of electrical conductors between electrical enclosures or equipment enclosures, where the voltage between circuit conductors or between conductors and ground is over 600 volts. Field performance has been satisfactory, and there is not sufficient technical rationale to support a 600 volt limitation for EMT.

Based on the technical information presented in this report, Underwriters Laboratories has identified EMT as suitable for use where the voltage between circuit conductors or between conductors and ground is over 600 volts.
APPENDIX A: CODE REFERENCES

NATIONAL ELECTRICAL CODE®:

ARTICLE 100 — DEFINITIONS

A. General

Identified: (As applied to Equipment.) Recognizable as suitable for the specific purpose, function, use, environment, application, etc., where described in a particular Code requirement. (See "Equipment.")

(FPN): Suitability of equipment for a specific purpose, environment, or application may be determined by a qualified testing laboratory, inspection agency, or other organization concerned with product evaluation. Such identification may include labeling or listing. (See "Labeled" and "Listed.")

Equipment: A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like used as a part of, or in connection with, an electrical installation.

Labeled: Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed: Equipment or materials included in a list published by an organization acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or material meets appropriate designated standards or has been tested and found suitable for use in a specified manner.

(FPN): The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.
ARTICLE 300 — WIRING METHODS

A. General Requirements

300-2. Limitations.

(a) Voltage. Wiring methods specified in Chapter 3 shall be used for voltages 600 volts, nominal, or less where not specifically limited in some section of Chapter 3. They shall be permitted for voltages over 600 volts, nominal, where specifically permitted elsewhere in this Code.

ARTICLE 348 — ELECTRICAL METALLIC TUBING

348-1. Use. The use of listed electrical metallic tubing shall be permitted for both exposed and concealed work. Electrical metallic tubing shall not be used (1) where, during installation or afterward, it will be subject to severe physical damage; (2) where protected from corrosion solely by enamel; (3) in cinder concrete or cinder fill where subject to permanent moisture unless protected on all sides by a layer of noncinder concrete at least 2 inches (30.8 mm) thick or unless the tubing is at least 18 inches (457 mm) under the fill; (4) in any hazardous (classified) location except as permitted by Sections 502-4, 503-3, and 504-20; or (5) for the support of fixtures or other equipment. Where practicable, dissimilar metals in contact anywhere in the system shall be avoided to eliminate the possibility of galvanic action.

Exception: Aluminum fittings and enclosures shall be permitted to be used with steel electrical metallic tubing.

Ferrous or nonferrous electrical metallic tubing, elbows couplings, and fittings shall be permitted to be installed in concrete, in direct contact with the earth, or in areas subject to severe corrosive influences where protected by corrosion protection and judged suitable for the condition.

(FPN): See Section 300-6 for protection against corrosion.
ARTICLE 710 — OVER 600 VOLTS, NOMINAL GENERAL

A. General


(a) Aboveground Conductors. Aboveground conductors shall be installed in rigid metal conduit, in intermediate metal conduit, in rigid nonmetallic conduit, in cable trays, as busways, as cablebus, in other identified raceways, or as open runs of metal-clad cable suitable for the use and purpose.

In locations accessible to qualified persons only, open runs of Type MV cables, bare conductors, and bare busbars shall also be permitted.

(b) Underground Conductors. Underground conductors shall be identified for the voltage and conditions under which they are installed.

Direct burial cables shall comply with the provisions of Section 310-7.

Underground cables shall be permitted to be direct buried or installed in raceways identified for the use and shall meet the depth requirements of Table 710-4(b).

Nonshielded cable shall be installed in rigid metal conduit, in intermediate metal conduit, or in rigid nonmetallic conduit encased in not less than 3 inches (76 mm) of concrete.

Exception No. 1: Type MC cable with nonshielded conductors where the metallic sheath is grounded through an effective grounding path meeting the requirements of Section 250-51.

Exception No. 2: Moisture-impervious metal sheath cable with nonshielded conductor where the sheath is grounded through an effective grounding path meeting the requirements of Section 250-51.

710-7. Grounding. Wiring and equipment installations shall be grounded in accordance with the applicable provisions of Article 250.

D. Installations Accessible to Qualified Persons Only

710-32. Circuit Conductors. Circuit conductors shall be permitted to be installed in raceways, in cable trays, as metal-clad cable, as bare wire, cable, and busbars, or as Type MV cables, or conductors as provided in Sections 710-4 through 710-6. Bare live conductors shall conform with Sections 710-33 and 710-34.
CANADIAN ELECTRICAL CODE®:

Section 12—Wiring Methods

Scope

12-000 Scope (see Appendix B)
(1) The provisions of Section 12 apply to all wiring installations operating at 750 V or less except for:
   (a) Class 2 circuits unless otherwise specified in Section 16; and
   (b) Community antenna distribution and radio and television circuits unless otherwise specified in Section 54; and
   (c) Optical fiber cables unless otherwise specified in section 56; and
   (d) Communication circuits as specified in Section 60; and
   (e) Conductors which form an integral part of factory built equipment.

(2) The provisions of this Section apply also to installations operating at voltages in excess of 750 V except as modified by the requirements of Section 36.

Section 36—High-Voltage Installations

Wiring Methods

36-100 Conductors
(1) Bare conductors or insulated conductors not enclosed in grounded metal shall be used only:
   (a) Outdoors; or
   (b) In electrical equipment vaults constructed in accordance with Rules 26-350 to 26-356; or
   (c) In cable tray in accordance with Paragraph (2)(d); or
   (d) In electrical equipment rooms accessible only to authorized persons.

(2) Except as permitted in Paragraphs (1)(b), (1)(c), and (1)(d), conductors used indoors or attached to buildings outdoors shall be:
   (a) Installed in metal conduit; or
   (b) Metal enclosed busways; or
   (c) Cables having a continuous metal sheath, steel wire armour, or of the interlocking armour type; or
   (d) Type TC tray cable installed in cable tray in accordance with Rule 12-2204.
APPENDIX B: HISTORICAL REFERENCES

General:

EMT was added to the NEC® in 1928, up to 2 inch trade size. The 2-1/2 through 4 inch trade sizes were added to Article 348 in 1965.

The first edition of UL 797, the Standard for Safety for Electrical Metallic Tubing [10], was issued in 1942. Use of EMT with circuit conductors rated over 600 volts increased in the mid to late 1960’s, after the NEC® recognized the use of the 2-1/2 to 4 inch trade sizes.

Proposals to prohibit EMT from being used as the equipment grounding conductor have been submitted for the 1987, 1990, 1993, and 1996 Editions of the NEC®. Each of these proposals was rejected by the NEC® Code Panel.

Article 710 revised to permit other raceways “identified” instead of “suitable”:

For many years, Article 710 specified that for circuits and equipment operating at more than 600 volts between conductors, circuit conductors were permitted to be installed in raceways suitable for the use and purpose. In 1990, Section 710-4 was revised to permit "identified" raceways, instead of "suitable", for over 600 volts.

This revision, as it turns out, has had a significant effect on the manner in which acceptability of EMT in over 600 volt applications is judged. Before 1990, the acceptability of the installation was determined by the AHJ on the basis of a technical judgement for each particular application. Since the revision, more importance is being attached to the ability to identify the product as suitable for the application, evidenced by markings or other written statements, rather than an assessment of the installation.

Proposals were made for both the 1993 and 1996 NEC® to remove reference to other identified raceways for over 600 volts. All such proposals were rejected by the NEC® Code Panel, which reaffirmed the intent of this section, to permit other suitable raceways provided they are identified.

EMT permitted to be used over 600 volts?

- The NFPA National Electrical Code Handbook®[11] stated that EMT is not intended for use over 600 volts, up to and including the 1968 Edition, after which the statement was omitted.
The American Electricians' Handbook\textsuperscript{®} [12], Eighth Edition, 1961, states that "Electrical metallic tubing should be used only for systems having a voltage of not more than 600." This statement was deleted in the Ninth Edition, issued in 1970.

McGraw-Hill's National Electrical Code Handbook\textsuperscript{®} [13], 1993 Edition, recommends checking with the local inspector having jurisdiction to determine if EMT is permitted for over 600 volt installations.

There were two proposals made to include EMT in Article 710, 1993 Edition. The Code Making Panel rejected both, stating that the accompanying substantiations did not support the proposals.

A 1990 proposal was made to revise the Canadian Electrical Code\textsuperscript{®} to permit EMT for high voltage installations (voltages in excess of 750 volts), provided the EMT contains a bonding conductor. After the first round of deliberations, the Section 36 Subcommittee recommended the acceptance of this proposal. Following the letter ballot, the subcommittee recommendation was amended to reject the proposal. Various opinions were expressed, including the EMT's ability to handle fault conditions, although no evidence of deficiencies related to use in over 750 volt circuits was presented.

In response to questions from inspection authorities regarding whether EMT was "identified" by UL for use with over 600 volt circuits, the Underwriters Laboratories Electrical Construction Materials Directory [14] was revised for the 1993 Edition. The following text was added: "Electrical Metallic Tubing is intended for use with conductors in circuits of 600V or less, and in electric signs."

Subsequently, UL became aware that the wording "other identified raceways" in Section 710-4 was being applied by some AHJ's to permit EMT in over 600 volt applications. It was noted that the UL evaluation of RMC, IMC, and RNC, all specifically recognized by the NEC\textsuperscript{®} for use with circuit conductors over 600 volts, was the same as for those raceways where intended to be used for circuit conductors at 600 volts or less.

Based on the acceptable field performance of EMT, UL did not possess a technical rationale to support this limitation. Instead, substantiation supporting the use of EMT for circuits of over 600 volts, such as the Georgia Institute of Technology study, was issued in 1994. Therefore, the restriction was removed in the 1995 Edition of the Electrical Construction Materials Directory.
The present UL Guide Information Page for Electrical Metallic Tubing (FJMX) includes the following wording:

"These Listings include electrical metallic tubing manufactured in trade sizes 3/8 to 4 in. incl. for installation of conductors in circuits rated above or below 600 V, nominal, and in accordance with Article 348 of the National Electrical Code."

The present UL Guide Information Page for Conduit Fittings (DWTT) includes the following wording:

"All fittings are intended to be installed in accordance with the National Electrical Code, and are intended for installation and use in accordance with the following information and the limitations specified in the appropriate conduit or tubing category."
NFPA® Special Technical Subcommittee on High-Voltage Installations:

For the 1971 and 1975 Editions of the NEC®, a proposal was made to delete Article 710 and any other Sections of the NEC® dealing with electric equipment operating above 600 volts, and substitute the California "High-Voltage Electrical Safety Orders" as revised and amended in the report by the NFPA® Special Technical Subcommittee on High-Voltage Installations. Without documented substantiation, Section 403-1(a) of this report states that "Electrical metallic tubing is not approved for high-voltage installations."

It was the action of the NEC® Correlating Committee that all Code Panel Chairmen having interest in the High-Voltage Technical Subcommittee Report be instructed to review the material and incorporate appropriate material into the Articles for which their Panels were responsible. It was also indicated that the Chairman of the Correlating Committee, in conjunction with the appropriate Code Making Panel Chairmen, be authorized to make the decision as to where the appropriate portions of the High-Voltage Technical Subcommittee Report were to be assigned.

This proposal was rewritten by The Institute of Electrical and Electronic Engineers (IEEE) and submitted for the 1978 Edition of the NEC®. Despite the Correlating Committee’s direction to incorporate appropriate material into existing NEC® Articles, this proposal again recommended revising Article 710 in its entirety, and deleting all other pertinent sections in other Articles that pertain to installations over 600 volts.

Regarding wiring methods, the rewritten proposal did not specifically prohibit EMT for over 600 volt applications, but instead proposed to permit "other suitable raceways".

It was the Code Making Panel (CMP13) recommendation to “accept in principle” certain “articles” of the proposal. CMP13 expressed its preference for all high-voltage rules to be grouped into one appropriate segment of the Code. The “article” covering wiring methods was not among the list of requirements accepted by CMP13. However, the Correlating Committee rejected the CMP13 recommendation, citing a lack of consensus in the voting. No further action was taken regarding this initiative.
APPENDIX C: DOCUMENT REFERENCES


