

Charles (Mike) Michael Holt

3604 Parkway Blvd, Suite 3, Leesburg, FL, 34748
888-632-2633 – Mike@MikeHolt.com

SUMMARY OF QUALIFICATIONS

Mike has taught over 1,000 classes on over 40 different electrical related subjects to over 20,000 students. He is committed to the electrical industry and is recognized as one of America's most knowledgeable electrical educators. He has worked his way up the trade from Apprentice Electrician, Journeyman Electrician, Master Electrician, Electrical Inspector, Electrical Contractor, Electrical Designer and developer of training programs for the electrical industry.

- More than 40 years' experience as a technical instructor. Skills include:

Curriculum Development	Individual and Large Group Training
Technical Expertise	Continuing Education
Publishing	Business Management & Growth

EXPERIENCE

President and CEO of Mike Holt Enterprises of Leesburg, Inc. 1975 - Present

Instructor

- Approved instructor in over 30 state electrical and construction boards in the U.S.
 - *Covering NEC® Changes, Electrical Theory, Grounding vs. Bonding, Solar Photovoltaic Systems, Limited Energy/Low Voltage, Understanding the NEC®, Train the Trainer, and Business Skills*
- Key Instructor for EC&M multiple annual seminars since 2000
- Created and taught an Electrical Train the Trainer program at the IEC National convention
- Taught an Electrical Train the Trainer workshop from 2000 - 2008
- Taught Exam Preparation at the local and state level since 1975.
- Instructed multiple seminars for the following Industry Organizations
 - NECA
 - GENERAC
 - IAEI
 - IBEW
 - ICBO
 - IBM
 - Boeing
 - Motorola
 - AT&T

Author

- Developed and authored multiple editions of the following titles that are sold to individuals and to electrical apprenticeship programs nationally.
 - *Understanding the National Electrical Code Volume 1 & 2*
 - *Basic Electrical Theory*
 - *Electrical Exam Preparation*
 - *Changes to the NEC®*
 - *Essential Rules of the NEC®*
 - *Power Quality*
 - *Limited Energy & Communication Systems*
 - *NEC Requirements for Grounding vs. Bonding*
 - *NEC Requirements for Solar Photovoltaic Skills*
 - *Business Management Skills*
 - *Electrical Estimating*
- Created Homestudy Training Programs for Exam Preparation, Code Training, Theory, and more.
- Current Code Writer for Electrical Construction & Maintenance Magazine, *EC&M*
- Wrote articles for top industry magazines and organizations
 - Electrical Design and Installation Magazine, *EDI*
 - *Solar Pro Magazine*
 - *IEC Magazine*
 - *Electrical Contractor*
 - CEE News
 - Electrical Contractor, *EC*
 - International Association of Electrical Inspectors, *IAEI*
 - The Electrical Distributor, *TED*
 - Power Quality Magazine, *PQ*
 - Electrical Construction & Maintenance Magazine, *EC&M*
- Designed Electrical Estimating Software that was sold nationally

Independent author for Leviton – 2000 – 2008

- Code Training book

Independent author for Delmar Publishers – 1999 – 2002

- Understanding the National Electrical Code
- Basic Electrical Theory
- Electrical Estimating

President and Founder of Electrical Contracting firm – Mike & Co., 1974 - 1980

- *Residential and Commercial Work*

Educational Background

- Studied Business Administration, M.B.A., University of Miami

State Licenses

- Electrical Contractor, State of North Carolina, L.25602 1999 - Present
- Electrical Administrator, State of Washington, HOLT*M*870RS 2013 - Present

Daniel Brian House

8850 SW 134th Ave, Dunnellon, Florida – (352)445-1805– Brian.house@mikeholt.com

Highly motivated exceptionally skilled manager with extensive experience in all facets of electrical installation, construction, maintenance, teaching and training.

Commended for innovation and integrity by multiple organizations with respect to project management, job execution, electrical and safety training, and knowledge of the NEC.

Demonstrates qualities of effective leadership and goal execution.

Effectively execute projects on many different scales in electrical, fire alarm, BMS control, Data, Video, industrial controls, security, access control, CCTV, and lighting control.

Dynamically presents training one on one and in the classroom on all NEC related topics.

Professional Experience

Technical Director | Mike Holt Enterprises – Leesburg, Florida 2010-Present

- Work on technical panels as an industry representative during video shoots
- Create and edit content for technical and training products
- Teach seminars on the National Electric Code, Electrical Safety, and Building code
- Manage development of apprenticeship training program and update course offerings
- Train outside instructors on proper presentation methods
- Coordinated AV setup and teardown at CEU seminars

President CEO | Dan House Electric Inc – Naples/Ocala – Florida 1989–1993, 2000-2009

- Held various positions learning operational aspects in all areas of the company
- Currently oversee all aspects of financial management
- Manage the development of policy and procedure during growth strategy
- Direct managers in the development of sales strategy
- Bid and cost large projects

Store manager | City Electric Supply – Ocala, Florida 1998 - 2000

- Directed purchasing and managed inventory
- Assured accuracy in billing
- Resolved customer disputes
- Managed counter employees and deliveries
- Processed Cash/Credit Card Banking
- Managed local Inventory annually

Performance Crew Manager | Lee University – Cleveland, Tennessee 1993-1995

- Directly managed schedules of 20+ employees to assure all events were staffed
- Assigned tasks for events and assured quality of performance support
- Maintained all inventory and equipment to university specs
- Improved existing systems for inventory and deployment of event equipment

Credentials

State Certifications:

State of Florida Unlimited Master Electrical License – EC13001573 Active since: 10/01/2002

State of Washington Electrical Administrator - HOUSEDB822OP Active since: 10/17/2018

Other Certificates:

MHE Approved Electrical Instructor and recipient of 2010 Top Gun Presenter Award

2010 Graduate MHE Solar Energy Boot Camp

MHE Grounding and Bonding Class

Generac Factory Certified Three Phase Service Technician

NEC Telecom Factory Certified Installer

Certified P&S Legrand Data Products Installer

Siemens Factory certified electrical solutions provider

Approved Johnson Controls Installation Contractor

Approved Simplex Installation Contractor

Factory Authorized Ademco Security Dealer

Factory Trained Uni-Cam Fiber Optic Connectors

Code Electrical Classes Inc. – 2008 Code Requirements

Fire Lite Factory Certified Installer

Extensive training in Industrial process and control

BBI CEO Training

Private Business Coaching By Mike Holt Enterprises

Electronic Service Control corporate training

Electrical Bid Manager Software Trained

Quantum Estimating Software Trained

Completed Course Work in Undergraduate Studies at

Lee University, Cleveland, TN. (1993-1995)

Completed courses within school of: Computer Programming/Information Systems & Christian Theology.

- Semester at Cambridge University, Cambridgeshire, England -SIE program - 1994

Professional Affiliations

National Fire Protection Agency - Member

Florida Association Of Electrical Contractors – Apprenticeship Sponsor

National Federation of Independent Businesses – Member

Mario Valdes

813 SW 143 AVE • Pembroke Pines, FL, 33027
Phone: (786) 285-2157 • E-Mail: Mario@mikeholt.com



Experience

Electrical Content Specialist

Mike Holt Enterprises Inc

01/04/ 2021 – current

- Edited and reviewed Understanding National Electrical Code volume 1 & 2 text, both 2017 and 2020 editions
- Edited and reviewed Electrical Exam Preparation 2017 & 2020 edition, assisted in development of practice questions.
- Edited and reviewed Solar & Energy systems 2017 & 2020 editions, assisted in development of graphics for PowerPoint.
- Edited and reviewed Grounding & Bonding 2017 & 2020 editions, assisted in development of video content.
- Edited and reviewed Basic Electrical Theory 2022 edition, assisted in development of video content.

Electrical Instructor

College of Business & Technology

01/15/2017 – 01/01/2021

- Provide NEC code classes to students in electrical associates science program to facilitate their knowledge
- Created entire curriculum including power points, quizzes, midterm, & final exams.
- Effectively educated students on electrical blueprint reading regarding estimating take offs & interpretations of riser diagrams, panel schedules, basic electrical theory of AC & DC fundamentals in wiring, motors, transformers, and generators
- Cover detailed standards in PLC programming, Photovoltaic systems, & Fire alarm systems
- Part of Mike Holt 2017 & 2020 exam preparations video team & certified instructors by his Curriculum.
- Voluntary member of UL standards technical panel for UL869A, UL67, UL1773, & UL98.

Chief Electrical inspector / plan examiner

Absolute Engineering

05/30/2016 - 01/01/2021

Private Provider

- Inspected all commercial, industrial, residential and public buildings, medical buildings, health care facilities, assisted living and elderly housing complexes.
- Reviewed and approved plans for electrical compliance with federal, state, & local codes. Monitored workmanship and recommended methods of improvements. Worked with engineers, consultants and lawyers to amend plans during the plan review process.
- Maintained detailed records and documentation of all site visits, inspections and violations.
- Calculate documents to improve operations and speed up turn-around times while working cooperatively to achieve excellent customer service.
- Administrative capabilities of leading an inspection team in efforts to cover construction deadlines.
- Attended meetings to discuss common grounds regarding electrical comments to engineering drawings

- Ability to interpret NEC codes & apply to practical applications out In the field
- Involved in different organizations such as IAEL, NFPA, BOAF, ICC in order to be informed on new standards
- Experience in large construction such as hi-rise buildings, multi-story residential, commercial build out improvements, schools, hospitals, and industrial motor – controls centers

Electrical plan examiner / Inspector

West Palm Beach – Municipal Support

04/20/2015- 5/23/2016

- Performed mathematical engineering computations to analyze electrical system.
- Reviewed and approved complex electrical plans and specs for compliance to NEC codes.
- Evaluate tests and data for suitability of electrical materials plus methods of construction installations.
- Respond to architects, engineers, contractors by scheduling conferences to interpret code issues and give recommendations for design professional problems
- Conduct field inspections using professional judgment and common sense for the intent of code enforcement.
- Inspected all commercial, industrial, residential and public buildings, medical buildings, health care facilities, assisted living and elderly housing complexes.
- Maintained detailed records and documentation of all site visits, inspections and violations & ensured compliance with appropriate federal, state and local codes.
- Investigated complaints, prepared and issued permits, certificates of occupancies, reports and maintained records of work performed. Issued violation notices and processed court appearances.
- Participated in inspector meetings relating to code changes and scheduled week hours in the absence of chief electrical inspector.

Project Manager / Estimator- MV Electrical Services

07/19/2012 - 03/11/2015

- Performed material takeoffs from blueprints, created material lists and contacted suppliers for pricing.
- Conducted pre-job walk-thru with customers and various subcontractors to discuss timelines and deadlines; attended weekly and monthly project meetings to update customer and various subcontractors on job progress.
- Supervised crews and handled manpower issues for multiple jobs being conducted simultaneously.
- Laid out day-to-day and/or week-to-week work duties for electricians.
- Produced quality engineering plans, ensuring compliance with department, project, company, utility, regional electrical entity and industry requirements and standards were met.
- Performed hands-on field work and troubleshooting of electrical systems in multifamily dwellings, commercial spaces and custom projects.
- Communicated with customers regarding change orders and how they affected the projects, and redistributed manpower accordingly keep projects within established deadlines.

Master Electrician- MV Electrical Services

05/02/2009 - 07/18/2012

- Connection of wires to transformers, circuit breakers, as well as other components.
- Fabrication and construction of parts, using hard tools and other specifics.
- Inspection of electrical equipment and systems to recognize defects, hazards and the requirement for repairs or modifications.
- Installation of ground leads and connection of power cables to various equipment.
- Replacement and repair of electrical wiring, fixtures, and equipment.
- Testing of circuit and electrical systems using devices including, voltmeters, ohmmeters, and oscilloscopes.
- Business management duties such as maintaining files and records.

Licenses

State Electrical Contractor

EC13005576

ICC and State of Florida License- BN6698

Standard Electrical Inspector

ICC and State of Florida License- PX3618

Electrical Plan Examiner

Education

CBT college

In Progress

Associates Degree in Electrical Engineering.

Mike Holt Electrical Apprenticeship Program

09/2012

Master Exam Code preparation.

Turner Tech community college

01/2012

Electrical fundamentals and code.

HML High School

06/2007

High School Diploma.

CERTIFICATE OF COMPLETION

Mike Holt Enterprises hereby certifies that

Sample Student

Student State & License Number

has successfully completed the

Title of Course

Date and Location

Additional Notes



MikeHolt.com | 888.632.2633

A handwritten signature in black ink that reads "Mike Holt". The signature is written in a cursive, flowing style.

Charles "Mike" Holt, Sr.
Certified Instructor

Course Hours:

Final Result:

Certificate ID:

State Approval Code:

Provider Information

Provider

Mike Holt Enterprises

Email

ceuonline@mikeholt.com

Phone

888-632-2633

General Information

Instructors

Main Instructor: Mike Holt

Backup Instructors: Brian House

Course Description

The goal of this class is to identify those significant changes and provide explanation and analysis to help the student understand the rules, their impact, and their practical application. This class brings you an accurate, in-depth coverage of the most important 2023 NEC® changes and how they may affect current and future projects.

This dynamic presentation translates the very technical language of the NEC® into everyday electrician's language to ensure a safe Code-compliant system that is designed, installed, and inspected to reflect the significant knowledge found in the 2023 NEC®.

Class Attendance Verification and Evaluation

Students' attendance is monitored with sign-in and sign-out sheets that verify actual time spent in the course. Students will also complete a course evaluation form for the course content and the instructor. Please see the accompanying packet for a sample of the Course Evaluation sheet.

- a. The students' sign in form will be stamped by our check-in staff.
- b. At the end of the class, the sign in forms are picked up by our staff. The students are handing them to us before they exit the class.
- c. In order to receive credit for the course, the sign in form must have signed in and out and must be stamped and must match the identification verified on the order.

Students will be provided an instructor and course evaluation during the class. We will collect and review each evaluation.

Contact Us:

www.mikeholt.com/ceu | 888-632-2633 | ceuonline@mikeholt.com

Course Materials

Students will receive the entire PowerPoint Presentation as a booklet at the beginning of class. The handout will include references and space to add their own notes. Cost to students is \$265. Please see the included packet for a sample of the handout

Schedule of Class Dates and Locations

Date	Time	Location
May 6th, 2023	8:00am – 5:00pm	Marriott Hotel, Coral Springs, Florida 11775 Heron Bay Blvd, Coral Springs, FL 33076
June 24th, 2023	8:00am – 5:00pm	Rosen Plaza Hotel, Orlando, Florida 9700 International Drive, Orlando, FL, 32819

Course Topics

Time	Topics
8:00am - 8:50am	Overview of the Changes Process
	Article 90
	90.4 Enforcement
	Article 100 - Definitions
	Article 110 - General Requirements for Electrical Installations
	110.3 Use and Product Listing of Equipment
	110.12 Mechanical Execution of Work
	110.17 Servicing and Maintenance of Equipment
	110.22 Identification of Disconnecting Means
8:50am - 9:00am	<i>Break</i>
9:00am - 10:20am	Chapter 2 - Wiring and Protection
	Article 210 - Branch-Circuits
	210.8 GFCI Protection
	210.12 Arc-Fault Circuit-Interrupter Protection
	210.23(A) 10-Ampere Branch Circuits
	Article 215 - Feeders
	215.15 Feeder Tap or Secondary Conductor, Barriers
	215.18 Feeders, Surge Protection
	Article 220 - Branch-Circuit, Feeder, and Service Load Calculations
	220.70 Energy Management Systems (EMS)
	Article 225 - Outside Branch Circuits and Feeders
	225.41 Emergency Disconnects
	225.42 Surge Protection

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	Article 230 - Services
	230.67(A) Services, Surge-Protective Device
	230.71 Maximum Number of Service Disconnects
	230.71(B) Two to Six Service Disconnecting Means
	230.85 Services, Emergency Disconnect
10:20am - 10:30am	<i>Break</i>
10:30am - 12:00pm	Chapter 3 - Wiring Methods and Materials
	Article 300 - General Requirements for Wiring Methods and Materials
	300.5(A) Minimum Cover Requirements
	300.14 Conductor Length at Boxes
	Article 314 - Boxes, Conduit Bodies, and Handle Enclosures
	314.29 Boxes, Wiring to be Accessible
	Article 352 - Rigid Polyvinyl Chloride Conduit (PVC)
	PVC, Expansion Fittings
	Article 358 - Electrical Metallic Tubing (EMT)
	358.10(A)(1) EMT, Uses Permitted
12:00pm - 1:00pm	<i>Lunch</i>
1:00pm - 2:20pm	Chapter 4 - Equipment for General Use
	Article 406 - Receptacles
	406.9(C) Receptacles, Bathtub and Shower Space
	406.12 Tamper-Resistant Receptacles
	Article 408 - Switchboards, Switchgear, and Panelboards
	408.4(A) Circuit Directory and Circuit Descriptions
	Article 410 - Luminaires, Lampholders, and Lamps
	410.10(D) Luminaires, Bathtub and Shower Areas
	Article 422 - Appliances
	422.18(B) Appliances, Ceiling Fan in Bathrooms
	Article 440 - Air-Conditioning and Refrigerating Equipment
	440.8 A/C Equipment, Bathtub and Shower Space
	440.14 A/C Disconnect Location
	Article 450 - Transformers
	450.10 Transformers, Grounding and Bonding
2:20pm - 2:30pm	<i>Break</i>
2:30pm - 3:00pm	Chapter 5 - Special Occupancies
	Article 555 - Marinas, Boatyards, Floating Buildings, and Docking Facilities
	555.4 Marinas and Docking Facilities, Service Equipment Location
	555.15 Marinas and Docking Facilities, Replacement of Equipment
	555.30 Marinas and Docking Facilities, Equipment and Connections
	555.34(A) Marinas and Docking Facilities, Wiring Methods
	555.35(A) Marina Feeder Conductors with GFPE and GFCI Protection
	555.36 Shore Power Receptacle Disconnect
	555.38 Marinas and Docking Facilities, Luminaires
3:00pm - 4:20pm	Chapter 6 - Special Equipment

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	Article 625 - Electric Vehicle Power Transfer System
	625.40 Electric Vehicle Branch Circuit
	Article 630 - Electric Welders
	630.8 GFCI Protection for Personnel
	Article 680 - Swimming Pools, Fountains, and Similar Installations
	680.5 Pools, Hot Tubs, and Fountains, GFCI and SPGFCI
	680.7 Pools, Hot Tubs, and Fountains, Grounding and Bonding
	680.10 Pools, Hot Tubs, and Fountains, Water Heaters and Heat Pumps
	680.14 Pools, Hot Tubs, and Fountains, Corrosive Environments
	680.21 Permanently Installed Pools Pool Pump Motors
	680.22(A)(4) GFCI and SPGFCI Protection
	680.54 Fountains, Connection to an EGC
	680.58 Fountains, GFCI or SPGFCI Protection, Receptacles
	680.59 Fountains, GFCI or SPGFCI Protection, Nonsubmersible Pumps
4:20pm - 4:30pm	<i>Break</i>
4:30-5:00pm	Chapter 7 and 8 - Special Conditions and Communications Systems
	Article 722 - Cables for Power-Limited Circuits, and Fault-Managed Power Circuits
	Article 724 - Class 1 Power-Limited Circuits
	Article 725 - Class 2 and Class 3 Power-Limited Circuits
	Article 726 - Class 4 Fault-Managed Power Systems
	Article 750 - Energy Management Systems
	Article 800 - General Requirements for Communications Systems
	Article 810 - Antenna Systems
5:00pm - 5:05pm	<i>Wrap Up</i>

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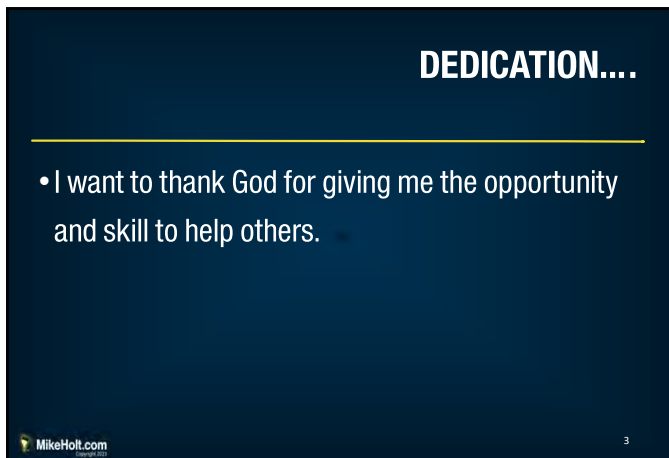
Sample of course PowerPoint. This material is property of Mike Holt Enterprises. Not permitted for distribution without prior approval.



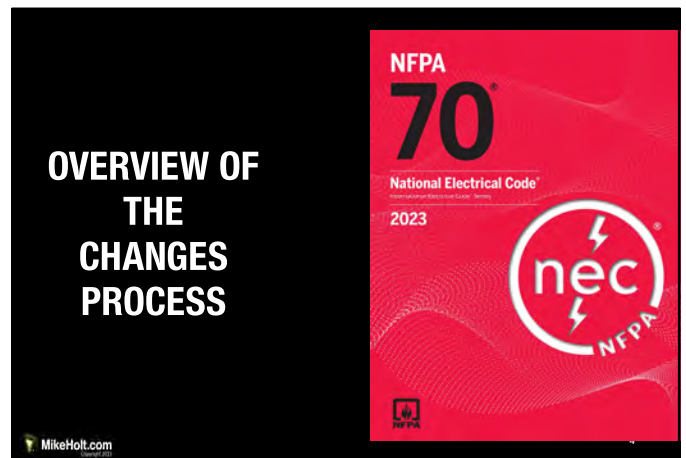
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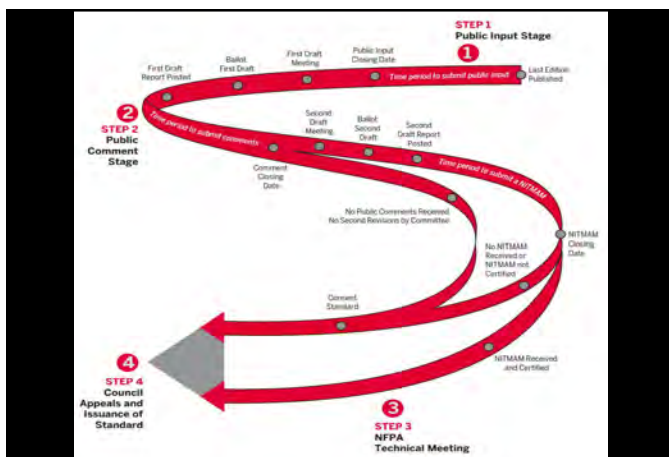
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Public Input. Following the publication of the current edition of an NFPA standard, the development of the next edition begins. A new or revised NFPA standard enters its next revision cycle beginning with the acceptance of Public Input (PI): the public notice asking for anyone interested to submit input on an existing standard or a committee-approved new draft standard. The call for Public Input and related closing dates are published in *NFPA News*, the American National Standards Institute's *Standards Action*, on NFPA's website, and other topic-related publications. Submissions are accepted electronically on NFPA's website at www.nfpa.org/doc#next (example: for NFPA 101, go to www.nfpa.org/101next). Following the closing date for public input, the committee conducts a First Draft Meeting to respond to all public inputs.

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COMMENT

CODE COMMITTEE'S REVIEW PROPOSED CHANGES

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Code-Making Panel No. 10

Articles 215, 225, 230, 240, 242

Julian R. Burns, Chair
Quality Tower Solutions, Inc., NC [IM]
Rep. Independent Electrical Contractors, Inc.

Paul D. Barnhart, U.I. LLC, NC [RT]
Scott A. Blizard, American Electrical Testing Company, Inc., MA [IM]
Rep. Inter-National Electrical Testing Association
James T. Dollard, Jr., IBEW Local Union 98, PA [L]
Rep. International Brotherhood of Electrical Workers
Ed Koepke, Nidec Motor Corporation, MO [M]
Kenneth J. Rempe, Siemens Industry Inc., GA [M]
Rep. National Electrical Manufacturers Association

Vincent J. Saporita, Estin's Busmann Business, MO [M]
Roy K. Sparks, III, Eli Lilly and Company, IN [U]
Rep. American Chemistry Council
Steven E. Townsend, General Motors Company, MI [U]
Rep. Institute of Electrical & Electronics Engineers, Inc.
Christopher R. Vance, National Grid, NY [UT]
Rep. Electric Light & Power Group/EEI
David A. Williams, Delta Charter Township, MI [E]
Rep. International Association of Electrical Inspectors

Alternates

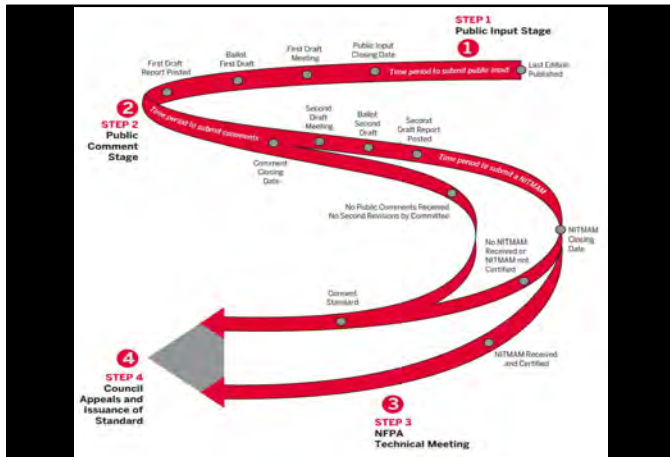
Anthony Dawes, DTE Energy, MI [UT]
(Alt. to Christopher R. Vance)
James Donsey, Douglas County Electrical Inspector, CO [E]
(Alt. to David A. Williams)
Kevin J. Lippert, Eaton Corporation, PA [M]
(Alt. to Vincent J. Saporita)
Richard E. Lofton, II, IBEW Local Union 280, OR [L]
(Alt. to James T. Dollard, Jr.)
Alan Masche, Schneider Electric, KY [M]
(Alt. to Kenneth J. Rempe)
David Morrissey, American Electrical Testing Company, Inc., MA [IM]
(Alt. to Scott A. Blizard)

Nathan Phillips, Integrated Electronic Systems, OR [IM]
(Voting Alt.)
Steve A. Struble, Freeman's Electric Service, Inc., SD [IM]
(Alt. to Julian R. Burns)
Peter R. Walsh, Teatrick Technical Associates, LLC, MA [U]
(Alt. to Steven E. Townsend)
Danish Zia, U.I. LLC, NY [RT]
(Alt. to Paul D. Barnhart)

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NATIONAL ELECTRICAL CODE COMMITTEE

Committee Scope: This Committee shall have primary responsibility for documents on minimizing the risk of electricity as a source of electric shock and as a potential ignition source of fires and explosions. It shall also be responsible for text to minimize the propagation of fire and explosions due to electrical installations.

These lists represent the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of this document.

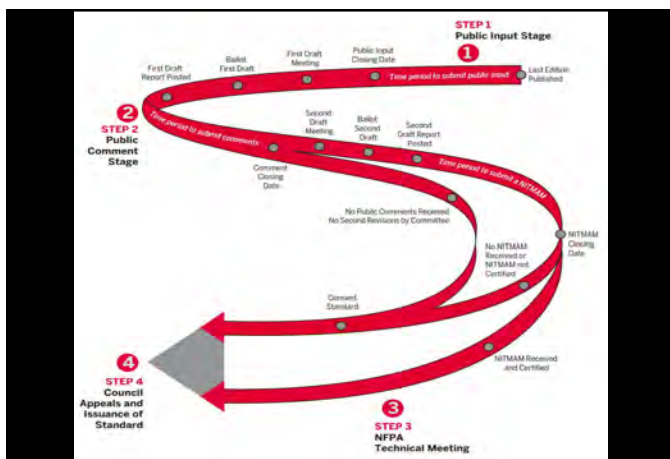
Correlating Committee on National Electrical Code

Lawrence S. Ayer, Chair
Biz Com Electric, Inc., OH [IM]
Rep. Independent Electrical Contractors, Inc.

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COMMENT

NEC USABILITY FEATURES

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ARTICLE 722
Cables for Power-Limited Circuits, Fault-Managed Power Circuits, and Optical Fiber

New Article

Part I. General

722.1 Scope. This article covers the general requirements for the installation of single- and multiple-conductor cables used in Class 2 and Class 3 power-limited circuits, power-limited fire

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ARTICLE 722
Cables for Power-Limited Circuits, Fault-Managed Power Circuits, and Optical Fiber

New Part

Part I. General

722.1 Scope. This article covers the general requirements for the installation of single- and multiple-conductor cables used in Class 2 and Class 3 power-limited circuits, power-limited fire

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ARTICLE 722
Cables for Power-Limited Circuits, Fault-Managed Power Circuits, and Optical Fiber

New Section

Part I. General

722.1 Scope. This article covers the general requirements for the installation of single- and multiple-conductor cables used in Class 2 and Class 3 power-limited circuits, power-limited fire

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722.3 Other Articles. In addition to the requirements of this article, cables shall comply with the requirements of sections (A) through (O). Only those sections of Article 300 referenced in this article shall apply.

(A) Installation of Cables and Conductors in Raceways. The number and size of conductors and cables, as well as the raceway sizing, shall comply with 300.17.

(B) Spread of Fire or Products of Combustion. Installation of cables in power-limited circuits shall comply with 300.21.

New Sub Section

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WARNING:
SINGLE 120-VOLT SUPPLY. DO NOT CONNECT MULTI-WIRE BRANCH CIRCUITS!

The warning sign(s) or label(s) shall comply with 110.21(B).

(D) Three-phase Supply. Stand-alone and microgrid systems shall be permitted to supply three-phase, 3-wire or 4-wire systems.

(E) Energy Storage or Backup Power System Requirements. Energy storage or backup power supplies shall be required.

(F) Voltage and Frequency Control. The stand-alone power sources shall be controlled during operation so that voltage and frequency are supplied within limits compatible with the connected loads.

Revised Text

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WARNING:
SINGLE 120-VOLT SUPPLY. DO NOT CONNECT MULTI-WIRE BRANCH CIRCUITS!

The warning sign(s) or label(s) shall comply with 110.21(B).

(D) Three-phase Supply. Stand-alone and microgrid systems shall be permitted to supply three-phase, 3-wire or 4-wire systems.

(E) Deleted or Relocated Rule or Backup Power System Requirements. Energy storage or backup power supplies shall not be required.

(F) Voltage and Frequency Control. The stand-alone power sources shall be controlled during operation so that voltage and frequency are supplied within limits compatible with the connected loads.

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⚠ **(C) Single 120-Volt Supply.** Stand-alone and isolated microgrid systems shall be permitted to supply 120 volts to single-phase, 3-wire service equipment or distribution panels with 240-volt outlets and where there are no multiwire branch circuits. In all installations, the sum of the ratings of the power sources shall be less than the rating of the neutral bus in the service equipment. This equipment shall be marked with the following words or equivalent:

WARNING:
SINGLE 120-VOLT SUPPLY. DO NOT CONNECT MULTI-WIRE BRANCH CIRCUITS!

The warning sign(s) or label(s) shall comply with 110.21(B).

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Mike Holt's
CHANGES TO THE NATIONAL ELECTRICAL CODE®
 2023 NEC
GLOBAL CHANGES IN THE 2023 NATIONAL ELECTRICAL CODE
 Introduction
 MikeHolt.com | 888.632.2633

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GLOBAL 2023 NEC CHANGES

- Public Inputs - 3,730
- First Revisions - 1400
- Public Comments to Public Inputs - 1,930
- Second Revisions - 634
- Correlating Revisions - 73

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GLOBAL 2023 NEC CHANGES

- Redundant language was removed, “subjective terms” rules were relocated or eliminated, rules were changed into a list format, and many other editorial changes were made to bring the Code text in line with the NEC Style Manual requirements.

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New Articles for 2023

Article 235

Branch Circuits, Feeders, and Services Over 1000V ac, 1500V dc, Nominal.

Article 245

Overcurrent Protection for Systems Rated Over 1000V ac, 1500V dc.

Article 305

General Requirements for Wiring Methods and Materials for Systems Rated Over 1000V ac, 1500V dc, Nominal replaces Article 399.

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New Articles for 2023

Article 315

Medium Voltage Conductors, Cable, Cable Joints, and Cable Terminations. This replaces 311.

Article 369

Insulated Bus Pipe (IBP)/Tubular Covered Conductors (TCC) Systems

Article 371

Flexible Bus Systems

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New Articles for 2023

- Article 495**
Equipment Over 1,000V ac, 1,500V dc. This replaces Article 490.
- Article 512**
Cannabis Oil Equipment and Cannabis Oil Systems Using Flammable Materials
- Article 722**
Cables for Power-Limited Circuits, Fault-Managed Power Circuits, and Optical Fiber

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New Articles for 2023

- Article 724**
Class 1 Power-Limited Circuits and Class 1 Power-Limited Remote-Control and Signaling Circuits
- Article 726**
Class 4 Fault-Managed Power Systems

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COPPER-CLAD ALUMINUM

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Conductor Material 110.5

The diagram shows three conductor types side-by-side. The top one is labeled 'COPPER' and shows a bundle of copper strands. The middle one is labeled 'ALUMINUM (Alloy AA-8000)' and shows a bundle of aluminum strands. The bottom one is labeled 'COPPER-CLAD ALUMINUM' and shows a bundle of aluminum strands with a thin copper cladding. A copyright notice at the bottom reads 'Copyright 2023, www.MikeHolt.com'.

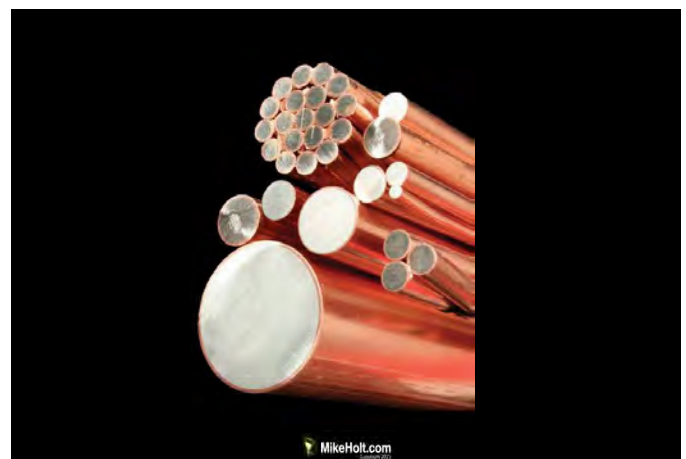
Conductors must be copper, aluminum, or copper-clad aluminum unless otherwise provided in this Code.

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COMMENT

ANTIOXIDANT PASTE?

- Mike, is aluminum or copper-clad aluminum wire required to be terminated differently than copper?
Is antioxidant paste required?

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Conductor Termination, Terminal Conductor Marking
110.14 Comment

Indicates a 75°C Terminal Indicates a 90°C Terminal

Copper Only	Aluminum Only	Copper or Aluminum	Copper or Aluminum

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Terminals that are suitable only for aluminum must be marked AL. Terminals suitable for both copper and aluminum must be marked CU-AL or AL-CU.

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COMMENT

- Some people use the antioxidant:
On the aluminum wire.
On the outside of the terminal.
On the threads of the terminal.
On copper wire!

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COMMENT

WHERE WOULD YOU USE COPPER CLAD ALUMINUM CONDUCTORS?

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