Agenda

Overview of Major Changes in 2017 National Electrical Code
Article 425: Fixed Industrial Process Heating
Article 691: Large-Scale PV Electric Power Production
Article 706: Energy Storage Systems
Article 710: Stand-Alone Systems
Article 712: Direct-Current Microgrids

Chapter 1: National Electrical Code
Requirements for electrical installations, including clearances and free space requirements about equipment
New reconditioned equipment, identification and traceability
New limited access working space requirement
New short-circuit current documentation

Chapter 2: Wiring and Protection
Grounded conductors
Voltage drop calculations
Branch circuit, feeder and services calculations
GFCI receptacle outlet requirements
Service requirements
Transformer protection
New GFCI protection for non-dwelling units

Grounding and Bonding
Grounding of service entrances
Grounding of separately-derived systems
Grounding electrodes
Sizing of grounding electrode and grounding conductor
Bonding of services

Chapter 3: Wiring Methods and Materials
Wiring methods—underground installation requirements
Conductors for general wiring
Conductor ampacity correction and adjustments
Number of conductors in a raceway
Pull and junction box fill calculation
New single-phase dwelling services and feeders

Chapter 4: Equipment for General Use
Flexible cords and cables
Receptacle requirements
Switchboards and panel boards
Short circuit rating
Luminaires, appliances, transformers and motors

Chapter 5: Special Occupancies
Hazardous locations
Commercial garages
Health care facility requirements
Recreational vehicle parks

Chapter 6: Special Equipment
Signs, outline lighting, elevators
Hybrid vehicle plug in requirements
Data center requirements
Pools and spas
Solar photovoltaic systems
Small wind turbine systems

Chapter 7: Special Conditions
Emergency systems
Class 1, 2, and 3 power-limited circuits
Fire alarm circuits

Chapter 8: Communications Circuits
Premises-powered broadband communication systems
Network-powered broadband communication systems

Chapter 9: Tables
Conductor fill and raceway calculation example

National Electrical Code 2017
Eagan, MN - Thursday, November 21, 2019

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PO Box 278
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Learning Objectives

You'll be able to:

Describe major changes in the 2017 National Electrical Code (NEC), including changes for large-scale photovoltaic electric power production, energy storage systems and direct-current microgrids.

Identify key requirements for wiring and protection, including requirements for grounded conductors, GFCI receptacle outlets and transformer protection.

Comply with requirements for grounding and bonding, including grounding of service entrances, grounding electrodes and bonding of services.

Analyze requirements for wiring, cords, and cables.

Comply with requirements for special equipment, including signs, elevators, data centers, and renewable energy systems.

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National Electrical Code 2017

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Identify the major changes to the 2017 NEC

Examine requirements for wiring and protection

Learn about grounding and bonding

Explore special equipment and special occupancies

Discuss communications circuits, emergency systems and fire alarm circuits

Continuing Education Credits

Professional Engineers
7.0 HSW PDHs

Architects
7.0 HSW PDHs
7.0 AIA LU|HSW

Electricians
7.0 Code/Energy Hours

International Code Council
.7 CEUs (Electrical)

Contractors
Non-Credit Continuing Ed.

AIA Continuing Education Provider

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WWW.HALFMOONSEMINARS.ORG

ICC PREFERRED EDUCATION PROVIDER

Faculty

Mark D. Cook *Regional Training Supervisor, Faith Technologies*

Mr. Cook is a master electrician in Wisconsin and Arizona. He has been in the electrical industry since 1978 and he owned and operated his own electrical commercial, residential and light industrial service company in Arizona from 1994 until the summer of 2015. Mr. Cook was an instructor for the Independent Electrical Contractors of Arizona (I.E.C), a four-year apprenticeship program facilitated at Gateway Community College in Phoenix. He hired and mentored an apprentice to win "Apprentice of the Year" at the national competition "Wireoff" held at Fort Worth, Texas, in 2012. Mr. Cook was also an instructor for the Electric League of Arizona educational program, teaching classes on grounding, bonding and the National Electrical Code. He has presented the NEC for HalfMoon Education and the Arizona Department of Transportation as well. Mr. Cook is an associate member of the International Association of Electrical Inspectors and was presented with the "Instructor of the Year" award from I.E.C. in the spring of 2015. He authors "Code Corner" a monthly article appearing in *The Electric Times*, an electric and lighting industry newsletter circulated throughout the southwest at local vendors and suppliers and to online subscribers. Mr. Cook is a National Fire Protection Association member, an International Association of Electrical Inspectors member and a certified and a commercial electrical inspector for the State of Wisconsin. He is a CEU provider for Iowa, Wisconsin and Minnesota.

Seminar Information

Holiday Inn Airport SE-Mall Area
2700 Pilot Knob Road
Eagan, MN 55121
(651) 454-3434

Registration
8:00 - 8:30 am

Morning Session
8:30 am - 12:30 pm

Lunch (On your own)
12:30 - 1:30 pm

Afternoon Session
1:30 - 5:00 pm

Tuition

$289 for individual registration
$269 for three or more registrations.

Each registration includes a complimentary continental breakfast and printed seminar manual. Registration does not include a copy of the Code itself.

Receive a reduced tuition rate of $101 by registering to be our on-site coordinator for the day. For availability and job description, please visit *www.halfmoonseminars.org*.

How to Register

- Visit us online at www.halfmoonseminars.org
- Mail-in or fax the attached form to 715-835-6066
- Call customer service at 715-835-5900

Cancellations: Cancel at least 48 hours before the start of the seminar, and receive a full tuition refund, minus a $39 service charge for each registrant. Cancellations within 48 hours will receive a credit toward another seminar or the self-study package. You may also send another person to take your place.

Continuing Education Credit Information

This seminar is open to the public and offers 7.0 HSW PDHs/ continuing education hours to professional engineers and architects in Minnesota. Educators and courses are not subject to preapproval in Minnesota.

This seminar is approved by the American Institute of Architects Continuing Education System for 7.0 LU|HSW (Sponsor No. J885). Only full attendance is reportable to the AIA/ CES. Visit *www.halfmoonseminars.org* for complete AIA/CES information under this course listing.

Engineers and architects seeking continuing education credit in other states will be able to claim the hours earned at this seminar, in most cases. Refer to specific state rules to determine eligibility.

The Minnesota Department of Labor and Industry Construction Code Licensing Division has approved this course for 7.0 Code/ Energy hours for Electricians (Sponsor No. S1712131).

The International Code Council has approved this event for .7 CEUs in the specialty area of Electrical (Preferred Provider No. 1232).

This seminar offers a non-credit continuing education opportunity to construction contractors. It has not been approved by any state contractor licensing entity for continuing education purposes.

Attendance will be monitored and attendance certificates will be available after the seminar for most individuals who complete the entire event. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

Additional Learning

Webinar Series

HEC-RAS Webinar Series

- **Hydraulic Principles and Applications**
  Tues., October 29, 2019, 11:00 AM - 1:00 PM CDT
- **Working with the HEC-RAS User Interface**
  Tues., October 29, 2019, 1:30 - 3:00 PM CDT
- **Water Surface Profiling**
  Thurs., October 31, 2019, 11:00 AM - 1:00 PM CDT
- **Steady Flow Surface Profile Demonstrations**
  Thurs., October 31, 2019, 1:30 - 3:30 PM CDT

Tree Preservation

- **Concrete and Pavement Design Principles**
  Wed., October 30, 2019, 11:00 AM - 12:00 PM CDT
- **Exterior Concrete Pavement Design**
  Wed., October 30, 2019, 12:30 - 3:15 PM CDT
- **Interior Concrete Slabs-on-Ground Design**
  Thurs., October 31, 2019, 11:00 AM - 1:00 PM CDT
- **Concrete and Pavement Maintenance and Sustainability**
  Thurs., October 31, 2019, 1:30 - 3:00 PM CDT

Distributed Batteries for Solar PV Systems

- **Distributed Batteries for Solar PV Systems, Part I**
  Wed., November 6, 2019, 11:00 AM - 2:15 PM CST
- **Distributed Batteries for Solar PV Systems, Part II**
  Thurs., November 7, 2019, 11:00 AM - 2:15 PM CST

Complying with ADA Standards for Accessible Design

- **Complying with State & Federal Accessibility Requirements**
  Thurs., November 7, 2019, 11:00 AM - 1:30 PM CST
- **Applying the 2010 & A117.1 Accessibility Standards**
  Fri., November 8, 2019, 11:00 AM - 1:30 PM CST

For more information visit:
www.halfmoonseminars.org/webinars/

Can't Attend? Order the Manual and Audio from the Live Seminar as a Self-Study Package!
Audio recordings of this seminar are available for purchase starting at $269. See registration panel for more information and please refer to specific state licensing rules or certification requirements to determine if this learning method is eligible for continuing education credit.

Registration

National Electrical Code 2017

Eagan, MN - Thursday, November 21, 2019

How to Register

Online:
www.halfmoonseminars.org

Phone:
715-835-5900

Fax:
715-835-6066

Code:

Mail:
HalfMoon Education Inc.,
PO Box 278, Altoona, WI
54720-0278

Complete the entire form. Attach duplicates if necessary.

Registrant Information

Name: _____
Company/Firm: _____
Address: _____
City:_____State: _____ Zip_____
Occupation: _____
Email: _____
Phone: _____

Additional Registrants:

Name: _____
Occupation: _____
Email: _____
Phone: _____

Name: _____
Occupation: _____
Email: _____
Phone: _____

Email address is required for credit card receipt, program changes, and notification of upcoming seminars and products. Your email will not be sold or transferred.

( ) I need special accommodations. Please contact me.

Tuition

( ) **I will be attending the live seminar.** Single Registrant - **$289.00**. Three or more registrants from the same company registering at the same time - **$269.00** each.

( ) **I am not attending.** Please send me the self-study package:

☐ Downloadable MP3 Audio/PDF Manual for **$269.00**.
☐ CD/Manual Package for **$289.00**. ☐ USB/Manual Package **$289.00.**

(Please allow four weeks from seminar date for delivery)

Checks: Make payable to HalfMoon Education Inc.

Credit Card: *Mastercard, Visa, American Express, or Discover*

Credit Card Number: _____
Expiration Date: _____ CVV2 Code: _____
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