

**WESTERN SECTION IAEI
ANNUAL MEETING SEPTEMBER 16-19, 2012
FORT SMITH, ARKANSAS**

1. Why are exceptions made for industrial establishments with regard to wiring practices and safety concerns in the NEC when most places (jurisdictions) do not require the licensing of the industrial electricians or maintenance personnel? [Example: 410.130(G)(1) Exception No. 4.]

2. Since the code prohibits insulating over K & T wiring, how do you deal with SEIDA and other weatherization projects that do so?

3. A paint booth has an exhaust fan that is rated for this application. Can LFMC be used to feed this fan?

4. What is the proper termination point for the grounding electrode conductor on a residential service? Is it the meter base or first point of disconnect in the service?

5. Can Table 310.15(B)(7) be used to size the conductors for a subpanel in a residence?

6. Is a standard wire-nut approved for a wet location as in an outside j-box? Is there a listed wet location wire-nut other than the ones approved for direct burial or in below grade j boxes?

7. Dual sensor smoke detectors have been required for a couple of years. A lot of wholesalers and retailers are still selling the old style smoke detectors. If they are still selling the old style that means a lot of people are still buying them. Where are the old style smoke detectors allowed to be used?

8. My grounding electrode system consists of a water pipe, a UFER, and a ground rod. My service conductors are 500kcmil copper. Can I run a 1/0 CU grounding electrode conductor to the water pipe, then a #4 cu conductor from the water pipe to the UFER, then a #6 cu from the UFER to the ground rod?

9. Is it permissible to install aluminum SER cable in an underground PVC raceway between a house and a garage?

10. Engineers often ask for a ground rod at parking lot lights. Should the wire from the ground rod be connected to the equipment ground from the lighting circuit?

11. A hvac contractor installed a 10 foot piece of 3/8 flex from the geo unit to a couple of circulating pumps. Is this allowed? Can a Romex connector be used to terminate the 3/8 flex?

12. A rigid metallic service conduit is installed outdoors from the meter socket down into a cement slab under the socket. Is an expansion fitting required for this conduit installation?

13. Can a marking pen be used to “legibly mark” the available fault current on a service disconnect? What if the marking is inside the door of an outdoor disconnect?

14. How do you seal the conduits that leave a class II area?

15. Where can we get an arc-fault receptacle?

16. A separate structure is fed with an underground feeder with an equipment ground. Outside the structure there is a tap box, the tap over-current protection next to the tap box and a panel inside the structure. Which of these 3 points does the grounding electrode conductor terminate?

17. What is a horsepower rated plug or receptacle?

18. A 480/277volt 3 phase service was installed without the grounded conductor being brought to the first disconnecting means, can a bonding bushing and a properly sized equipment bonding jumper at both the transformer and the disconnecting means be used instead?

19. What can be used as extra corrosion protection for steel conduits buried in the earth or concrete? Does the galvanization on some conduits meet the requirements?

20. Is it permissible to install locknuts taken from an EMT connector on Rigid Metal Conduit?

21. How do we get the utilities to provide the information we need to calculate the fault currents as required in 110.24?
22. What kind of receptacles can be installed in Class II division 1 and division 2 areas?
23. A utility interactive PV inverter has built in output overcurrent protection. The output conductors terminate in a non-fused disconnect prior to terminating in the utility transformer. Should there be overcurrent protection at the disconnect? And if not, wouldn't the inverter need to be service rated?
24. What is the sizing ruling for an equipment grounding conductor in a raceway that contains multiple circuits?
25. Where is the distance the equipotential bond wire is required to be installed, measured from the edge of a concrete pool, without a deck?
26. What are the field marking requirements for available fault current at electrical service equipment?
27. Are flexible metal conduit and liquid tight flexible metal conduit allowed to serve as an equipment grounding conductors by the NEC?
28. In a solar photovoltaic installation, can the EMT raceway system between the modules and the inverter be recognized as the equipment grounding conductor or is it necessary to install an equipment grounding conductor in the raceway?
29. Can a listed outlet branch-circuit type AFCI be installed on a 2-wire branch circuit to comply with 210.12(B)(2) without installing an equipment grounding conductor?
30. Describe and discuss when bond bushings are to be used.
31. What type of a grounding electrode system is required for the inverter of a small wind turbine?

32. Is it permitted to use the same EGC (equipment grounding conductor) for two separate systems with two different voltages, such as a 277/480 and a 120/240 volt system?
33. A 15-ampere, 120-volt duplex rated receptacle is installed to supply a 1/3 HP, 120-volt disposal from a 20-ampere rated circuit. A CO/ALR 120-volt, 15-ampere, general-use rated snap switch is installed to control the disposal's operation. Does this installation meet NEC requirements?
34. Is it required to bond an outside generator grounding electrode system (it is a separately derived system) to the building grounding electrode system? If it is not a separately derived system, is it required to have a grounding electrode system since it's a separate structure?
35. Can SO cord be dropped from a bar joist to a display shelf (end cap) and hard-wired to a junction box on that display unit or does it have to be installed in conduit?
36. What fittings are approved to be used on the exterior of a building, weather proof or rain tight?
37. We increased the size of the circuit conductors on a pumping station to compensate for the voltage drop. We increased in size from a #6 AWG copper to a 1/0 copper conductor. What if anything needs to be done with the equipment grounding conductor when the circuit conductors are increased?
38. Are rain-tight hubs listed for bonding purposes on the line side of a service?
39. What wiring method shall be used for DC photovoltaic source and output circuits inside a building, without a disconnect switch on the outside of the building at the point of entrance?
40. Is a supplemental grounding electrode required for a concrete-encased electrode? My inspector says I have to drive a ground rod. The water piping system serving the building is plastic.
41. When does an arc-flash warning label need to be installed?

42. Where a photovoltaic system serves both dc and ac circuits with no direct connection between the dc grounded conductor and the ac grounded conductor, would each system be required to have separate grounding electrode systems and to what all would be these systems be required to be bonded?

43. I have installed liquidtight metal flexible conduit to several RTU's (rooftop units). The space above the ceiling is used for environmental air return. The inspector has asked me to replace it. Can't it be used in this application?

44. What is the minimum size for an equipment bonding jumper on the supply side of a service with 5-parallel 500 kcmil copper conductors?

45. Can a transfer switch for a standby power system be located between the meter and an existing panelboard? Does the grounding electrode conductor and the main bonding jumper need to be relocated from the existing panelboard to the transfer switch?

46. We are back feeding from a PV inverter to the MDP. There is no room for breakers, so can we drill and attach to the bus bar if we have overcurrent protection ahead of the connection?

47. What type of a grounding electrode system is required for the inverter of a small wind turbine?

48. A small maintenance building was built on a concrete foundation 500' away from the main building. The building has a 150 amp service fed underground from the main building. This feeder contains a grounded conductor and an equipment grounding conductor. Is it required to connect this subpanel to the rebar in the footing?

49. Why can't a conduit that sleeves NM conductors above a panel penetrate a finished ceiling?

50. A room in a residential basement has sheet rocked walls and ceiling and is used for storage with a work bench in the corner. The receptacles installed are only in the bench area. Do these receptacles need to be arc-fault or ground fault protected?

51. Are cords (S or SJ) allowed for temporary equipment connections in Hazardous Locations (Class 1, Div. 1 or 2)? [Thinking in terms of power outages]

52. Can you install metallic-sheathed cable (such as MC) in PVC conduit in a slab in a medical facility?
53. Is wiring installed only below the floor of an unclassified room as described in Art. 513.3 D, that is inside of an aircraft hanger, considered to be under the hanger floor and therefore required to be sealed?
54. Would ice cream/frozen yogurt or custard prep area without "cooking" equipment be considered a kitchen?
55. Are there any special conditions required for supplementary grounding electrodes used to limit voltages imposed by lightning on a wind generator?
56. Can a GFCI receptacle be installed in a 2 inch deep handi-box that has 2 mc single circuit cables that enter at the ends of the box?
57. Engineers often ask for a ground rod at parking lot lights. Should the wire from the ground rod be connected to the equipment ground from the lighting circuit?
58. What is the maximum number of #12awg THHN conductors allowed in a 3/8" flex metal conduit supplying a motor circuit?
59. What is the rule for adjusting the ampacity of conductors based on the number of conductors in the raceway?
60. On a single lot you have a 200 amp main breaker single phase meter pedestal located out by the front sidewalk of a zoned single family residential neighborhood. The 200 amp main breaker electrical panel is located on the basement foundation load bearing cement wall within 5 ft of the "point of entrance" of the wire penetration. How many conductors are required? What type of grounding is required both at the pedestal and the dwelling structure? You have plastic water line, CSST gas line, Satellite / telephone compatible, Ufer.
61. A receptacle in an aircraft hanger is GFCI protected with a GFCI breaker in the panel. This panel is in a separate room that is locked. Is this GFCI protection considered readily accessible?

62. Our local fire marshal tells me that a typical power strip is considered an extension cord to him, and he wants them removed. As you know most homes, offices, and I am sure the fire marshal's office has one under the desk for all the computer accessories. Some are built better than others, are they allowable by code for use all the time, or are they considered an extension cord, for temporary use?

63. Is a neutral conductor to be installed in all 3 and 4 way switches?

64. What are the conductor fill requirements for signaling circuits?

65. How far does a Class I, Division 2 area at an open paint spray extend? Is there any other method of sealing the conduit that is approved other than sealing compound leaving a Class I, Division 2 area?

66. Are the receptacles in a mental health facility located in a group therapy room considered a patient care area?

67. A transformer has the neutral bonded inside the transformer. Where is the gec connected, the panel or the transformer? Does this need to be a separate conductor to the grounding electrodes?

68. A receptacle is added in a residential bedroom in a new location on an existing circuit. Does this existing receptacle circuit now need to be arc-fault protected?

69. Can we use the reinforcing rods in the concrete deck around a swimming pool to bond the metal pool accessories?

70. Is an above grid return air plenum considered a hollow space for the installation of a transformer smaller than 50Kva?

71. Is it required to have a listing for Solar Panel on clips and supports of the Solar Panels?

72. What type of metal halide lamp is required in open type luminaires?

73. I have been told that sawdust is not considered a combustible. I have been in hardwood mills where hardwood dust is almost too fine to be handled by the dust collector system. Should these type plants be wired Class II, Division 1 or 2?
74. Engineers often ask for a ground rod at parking lot lights. Should the wire from the ground rod be connected to the equipment ground from the lighting circuit?
75. Is the room side of a kitchen Island counter, to be considered wall space, i.e. when there is a kitchen nook that is part of the same area and the counter back side is facing the nook?
76. NEC 110.14 requires connectors and terminals for conductors more finely stranded than Class B and Class C stranding to be identified for the specific class or classes. Is such identification uniform among all manufacturers and can you provide examples of the identification?
77. If a spare ungrounded conductor is installed from switch locations in dwelling units to ceiling mounted outlet boxes, but not connected to a switch, would the ceiling mounted outlet box be required to be suitable for fan support?
78. Can I install 5 # 6 AWG, THHN conductors in a three quarter inch diameter EMT or do I have to use 1- inch diameter?
79. We installed a 1200 Ampere, 480 Volt panel with a front workspace of 3 ½ feet to a concrete wall. The inspector says we need 7 feet of workspace. Is she correct?
80. When calculating the load at an RV park that contains a 50,30 and 20 at each pedestal, do I calculate each at 9600 or can I use the ratio of 20% are 50's and 70% are 30's and the last 10% are 20s?
81. Are expansion fittings required where a conduit emerges from the ground and runs up a wall to a junction box? For arguments sake, the expansion will exceed ¼ inch. Is the earth considered a “securely mounted item”?
82. Is the room side of a kitchen Island counter, to be considered wall space, i.e. when there is a kitchen nook that is part of the same area and the counter back side is facing the nook?

83. A motor nameplate does not state “thermally protected”, but has a winding embedded motor thermostat. Can you consider that this thermostat provides the thermal protection for the motor?

84. NEC 314.27(A) (2) seems to require all ceiling boxes used to support luminaires be able to support a minimum of 50 pounds. Are all round and octagon outlet boxes, including ½-inch pancake boxes, evaluated to support 50 pounds?

85. Are there any communications cables designed for use in ducts specifically fabricated for environmental air as identified in 300.22(B) and would these cable, if any, be allowed for any wiring application?

86. The installation has a 75 KVA dry-type transformer. Can this transformer be loaded to its full rating (75 KVA) or is it limited to 80% maximum load?

87. The owner says he has to remove the takeout auger if the bin plugs up with hard grain. Can I use so cord for the permanent wiring method?

88. Why is sealtight limited to 6ft outside the hot tub? Should it not be up to the inspector to determine if it is subject to physical damage?

89. What type of sealing compound can be used for the conduit seals at the boundaries of a Class 1 Division 2 location where they are not required to be explosion-proof?

90. In a new structure where the rebar was covered before the electrician was on site, what would be some other options to provide a Ufer ground that would be acceptable?

91. Is the expansion foam that is used to seal air passages around NM cable identified or listed for use with the outer jacket of the NM cable?

92. If I am wiring 5 208V 3 phase welders for welders in a shop. They are positioned on production lines and there will never be more than one welder operating at a time. Can I put them on the same circuit?

93. Do we have to have a warning tape in a ditch if the conductors are in conduit?

94. Can panel boards be installed in “janitor closet” in a school?

95. Is a non-fused switch acceptable as a service disconnecting means?

96. In a residential application, can a #4 copper conductor be protected with a 100A breaker to a feeder panel?

97. If an outdoor generator is equipped with a readily accessible disconnecting means, is an additional disconnecting means required where the ungrounded conductors service or pass thru the building or structure served?

98. A 16ga extension cord with a triplex female receptacle end on the cord was found at a customer’s house, with a running 1500 watt space heater plugged into the cord. My question is, those cords have been around for years, and most of the time, they are being over loaded. How are the cords code compliant when they have three receptacles on them, and no built in over-current protection? And how can something like this be listed?

99. It is required that elevators have a single means for disconnecting all ungrounded car light, receptacle(s), and ventilation power-supply conductors for that elevator car. The disconnecting means is required to be an enclosed externally operable fused motor circuit switch or circuit breaker capable of being locked in the open position. Could a general-use snap switch suitable only for use on ac be utilized per 430.109(C) if it can be installed where it can be locked in the open position?

100. Can a flexible cord be used for the service conductors of a temporary panel?

101. A high pressure spray washer is 1 phase and less than 250 volts. Can this equipment be hard wired to a disconnect or a j-box? The cord and plug pressure washer at this rating needs to be GFCI protected in the cord or receptacle as per 422.49. If direct wired is GFCI protection required? In the UL White Book DMKK it seems to read a receptacle is required.

102. If the label on the panel specifically says that the installation of circuit breakers other than the manufacturer’s breakers will void the warranty, can you install other manufacturers breakers if they are listed as interchangeable by a testing laboratory?

103. A swimming pool installed at a single-family dwelling has several motors, as well as other loads associated with it, and a panel in a NEMA 3R enclosure is installed on posts near the pool equipment to serve these loads. An inspector has called this a separate structure and is requiring a main breaker in the pool panel. Are the posts that the pool panel is mounted to considered to be a structure?

104. Where can we get an arc-fault receptacle?

105. A hydro-massage tub has faucets that are metallic. Some are single faucets and some use a metallic unit with both the hot and cold water. Do these faucets need to be bonded? How is this done if required?

106. 2011 NEC 630.13 added the word “identified” as a descriptive word for disconnecting means. Is the word “identified” being used in the sense of the definition of “identified” in Article 100 or in the sense of 110.22, Identification of Disconnecting Means, to indicate its purpose?

107. A temporary panel has a receptacle for a construction office/job trailer. Does this receptacle need to be GFCI protected?

108. If you extend existing circuits that have a shared neutral, is it required to install handle ties on the breakers if they were existing without the tie?

109. NEC 702.4(B) (2) requires optional standby sources, utilizing automatic transfer equipment, to be sized to supply the full load, calculated in accordance with Article 220, or employ a load management system. Does this require the load management system to be included with the source (normally a generator), in the transfer equipment, or as a separate piece of equipment?

110. Is it permissible to utilize the guy wires used to steady a wind turbine tower as part of a lightning protection system, and if yes, are there any special requirements for using the guy wires and their support footings?

111. A utility interactive PV inverter has built in output overcurrent protection. The output conductors terminate in a non-fused disconnect prior to terminating in the utility transformer. Should there be overcurrent protection at the disconnect? And if not, wouldn't the inverter need to be service rated?

112. When wiring a hot tub in a residential application, I run a 6/3 nm from load center to hot tub disconnect, then from the disconnect, using liquid tight flexible conduit, or PVC conduit, go to the hot tub. Wiring in the seal tight/PVC would be #6 THHN with a #10 green for equipment ground. Is the 6/3 NM allowable for this installation because it has a bare equipment grounding conductor?

113. NEC 310.10(G) requires conductors installed in corrosive conditions to have insulation suitable for the application. What type conditions would cause deleterious effects on conductors or insulation and what type insulation would be suitable for those applications? Please give an example of such environment.

114. Is GFCI protection required for temporary wiring in exhibition halls used for display booths in a trade show?

115. Where a 277/480 volt, 3-phase, solidly grounded wye voltage system serves a legally required standby system utilizing 1000 ampere or more circuit protective devices, is there any special requirements for installing ground fault protection?

116. Where a set of branch circuit conductors only pass through a panelboard and do not originate or terminate in the panelboard they are passing through, is there any requirement for identifying where the overcurrent device is located for these conductors?

117. Is each 120-volt receptacle required for an electrified truck parking space required to be served by an individual 120-volt branch circuit? Are there a minimum number of 120-volt receptacles required for each electrified truck parking space?

118. What type of a grounding electrode system is required for the inverter of a small wind turbine?

119. Are chase nipples recognized for bonding purposes between two metallic enclosures on the line side of the service disconnecting means? How about on the load side of the service equipment?

120. This question is regarding non-dwelling unit service equipment. Is this equipment required to be field marked with the amount of available fault current when installed or modified as required per NEC 110.24? This needs to be addressed thoroughly to the point

that all electrical contractors are aware of the requirement, how to meet the requirement and that any AHJ can feel what is written on the field marking is accurate. I personally want to be knowledgeable enough to make this calculation myself.

121. What is the maximum vertical length 250 MCM Cu conductors can run in a wireway without support?

122. Is it required to run a bond wire from a photovoltaic inverter grounding electrode system to the intersystem bonding terminal at the normal service disconnect means served by the utility? If the answer to the question is yes, what is the minimum size for such bonding conductor?

123. Are there special wiring requirements for commercial woodworking shop fluorescent lighting?

124. Does Section 230.71(A)1 require a service disconnect on the structure or could it be located away from the structure (pole)? If it can be located away, what is the maximum distance?

125. What wiring method shall be used for DC photovoltaic source and output circuits inside a building, without a disconnect switch on the outside of the building at the point of entrance?

126. The package labeling for metal halide fixtures states: "Use 110 C supply wires". Does that mean 110 degree C conductor insulation for the entire circuit? What conductor is rated for 110C? What Table does one use?

127. I am wiring one gas and two diesel tanks with dispensing motors for a farmer. These tanks are above ground and hold 10,000 gallons a piece. Do I reference Article 514, 515 or both in wiring them? Also, does the code mandate these tanks be in a dike? Can you run PVC two feet under the concrete near gas pumps for equipment that is not for the gas pumps?

128. The paving in a gas station parking lot is going to be 6 inch thick concrete. When applying the depth requirements from 300.5, do I measure from the top of the concrete or the top of the dirt?

129. Where multiple motors are used to drive a bridge crane as a unit and are protected by a single set of overload devices with a rating equal to the full load current of the all the motors, how is an over-temperature condition handled that may happen in any of the individual drive motors?

130. A high leg system is added to an elevator and the main panel is marked for the presence of the high leg as per code. A pipe run containing three hots only is run out to disconnect by hopper tank for motor. Does this disconnect need to be labeled for the presence of a high leg also?

131. What type of sealing compound can be used for the conduit seals at the boundaries of a Class 1 Division 2 location where they are not required to be explosion-proof?

132. Does a commercial building need an outside light for egress at the walkout door?

Moderator - Don Offerdahl

Code Panel 1 Members:

1. Mark W. Earley 1, 9, 17, 25, 33, 41
2. Mike Johnston 2, 10, 18, 26, 34, 42
3. David Kendall 3, 11, 19, 27, 35, 43
4. Richard Loyd 4, 12, 20, 28, 36, 44,
5. Alan Manche 5, 13, 21, 29, 37, 45
6. Chuck Mello 6, 14, 22, 30, 38, 46
7. Don Iverson 7, 15, 23, 31, 39, 47
8. Dave Williams 8, 16, 24, 32, 40, 48,

Moderator - Dick Owen

Code Panel 2 Members:

1. Keith Lofland 49, 56, 63, 70, 72, 84
2. Tom Moore 50, 57, 64, 71, 78, 82
3. Vince Saporita 51, 58, 65, 72, 79, 86
4. Marcus Sampson 52, 59, 66, 73, 80, 87
5. Phil Simmons 53, 60, 67, 74, 81, 88
6. Charlie Trout 54, 61, 68, 75, 82, 89
7. Robert Fahey 55, 62, 69, 76, 83, 90

Moderator - O.P. Post

Code Panel 3 Members:

1. Tom Lichtenstein 91, 98, 105, 112, 119, 126
2. Tim McClintock 92, 99, 106, 113, 120, 127
3. Joseph Wages 93, 100, 107, 114, 121, 128
4. Dave Bredhold 94, 101, 108, 115, 122, 129
5. Chad Kennedy 95, 102, 109, 116, 123, 130
6. Phil Clark 96, 103, 110, 117, 124, 131
7. Steve Froemming 97, 104, 111, 118, 125, 132