State of Wisconsin
DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES

Electrical &Lighting Program
Fall 2015
Code Panel Questions

1. I have a question in regards to the location of a 112.5 KVA dry type transformer. The transformer is proposed to be located within a 8' x 8' square room with a 4' ceiling height, the access opening into this room is 30" wide x 36" tall. Is this installation acceptable? NEC 110.26 (A)(3) requires the 6'6" height, but I know in the past the State has said 110.26(A)(1) does not apply to transformers, so I am assuming (A)(3) doesn't apply either. NEC 110.26(C)(1) requires sufficient access to and egress from the working space, is the 30" wide by 36" tall opening acceptable?

   Answer: Yes, Yes
   Code Reference: NEC 450.21(A); SPS 316.110; AHJ
   For a dry-type transformer rated not over 112 ½ kVA installed indoors needs a separation of 12 inches from combustible material unless separated from the combustible material by a fire-resistant, heat-insulated barrier. The exception to this requirement indicates that if this transformer is rated 600 volts or less and completely enclosed with or without ventilating openings, then the 12 inch requirement is not necessary. As for the installation described in the question, the transformer would not likely need to be, nor should be energized while servicing. NEC 110.26(A) declares that the requirements in NEC 110.26(A)(1), (A)(2) and (A)(3) apply to equipment likely to be energized for examination, adjustment, servicing or maintenance. However, SPS 316.110 would require the transformer to be installed per manufacturer's instructions which may include other restrictive requirements. NEC 110.26 the base rule states access and working space shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment. This may be a judgement call by the AHJ.

2. I have a 2000 amp 480 volt service installed where the grounding electrode conductor (GEC) is installed from 1 side of the building to the opposite side of the building. We are installing a new dry type transformer, 480 to 120/208 volt 3 phase, 4 wire and would like to install the GEC for this new separately derived system and tap onto the existing 3/0 copper GEC for the service, is this permissible?

   Answer: No

Code Reference: NEC 250.30(A)(5)
NEC 250.30(A)(5) addresses the installation of the grounding electrode conductor for the separately derived system. This section is located in Part II of NEC 250 which is titled "System Grounding". The installation requirements for the grounding electrode system is located in part III of NEC 250 and is titled "Grounding Electrode System and Grounding Electrode Conductor". Per the NEC Style Manual, one section of the code may not utilize another section of the code, unless it references that section. In NEC 250.30(A)(5), the only reference to connecting to the service grounding system is in Exception #2 which states: if a separately derived system originates in listed equipment suitable as service equipment, the grounding electrode conductor from the service or feeder equipment to the grounding electrode shall be permitted as the grounding electrode conductor for the separately derived system, provided the grounding electrode conductor is of sufficient size for the separately derived system. If the equipment grounding bus internal to the equipment is not smaller than the required grounding electrode conductor for the separately derived system, the grounding electrode connection for the separately derived system shall be permitted to be made to the bus. Therefore, the connection to the service grounding electrode conductor would not be permitted, and a separate grounding electrode conductor for the separately derived system would have to be sized and installed per NEC 250.30.

3. Am I required to install romex (NM cable) thru the floor joists in a crawl space?

   Answer: No
   Code Reference: NEC 334.15(C)
   NEC 334.15(C) has requirements for installing NM cable in unfinished basements and crawl spaces. It states that where NM cable is run at angles with joists in unfinished basements and crawl spaces, it shall be permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges of the joists. Smaller cables shall be run either through bored holes in joists or on running boards.

4. I have a new fire station being constructed and the Electrical Engineer has the overhead garage doors for the ambulances and fire trucks on the emergency system, is this acceptable? I am thinking these should be on the optional standby system.

   Answer: No
   Code Reference: NEC 700.2; IBC Chapter 27
   NEC 700.2 defines the emergency systems as those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction. These systems are intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure of the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life. This section also has an Informational Note that says Emergency systems are generally

installed in places of assembly where artificial illumination is required for safe exiting and for panic control in buildings subject to occupancy by large numbers of persons, such as hotels, theaters, sports arenas, health care facilities, and similar institutions. Emergency systems may also provide power for such functions as ventilation where essential to maintain life, fire detection and alarm systems, elevators, fire pumps, public safety communications systems, industrial processes where current interruption would produce serious life safety or health hazards, and similar functions. Chapter 27 defines what systems are required to be installed on both the Emergency and the Legally Required Standby Systems. Garage door openers are not on the items defined that would require connection to the emergency or legally required systems. Installation on the optional standby as a priority load would be a design consideration and not mandated by the electrical or building code.

5. Can I secure a temporary service to a job trailer, the AHJ says no, that 550.32(A) prohibits this overhead temporary service from being secured to the job trailer. He says 550.4(A) requires the temporary service to be installed for the job trailer with the same requirements as for mobile homes, I think he is confused!!

   Answer: No
   Code Reference: NEC 550.4; NEC 550.32(A)
   The inspector is correct. NEC 550.4(B) requires that mobile homes installed in other than mobile home parks shall comply with this section. NEC 550.4(A) allows that mobile homes not intended as a dwelling unit, such as a contractor's on-site office shall not be required to meet the provisions of this article pertaining to the number or capacity of circuits required, but shall meet all other applicable requirements of this article. NEC 550.32(A) specifically states the mobile home service equipment shall be located adjacent to the mobile home and ***not*** *mounted in or on the mobile home. The service equipment shall be located in sight from and not more than 30 feet from the exterior wall of the mobile home it serves. The service equipment shall be permitted to be located elsewhere on the premises, provided that a disconnecting means suitable for use as service equipment is located within sight from and not more than 30 feet from the exterior wall of the mobile home it serves.*

6. Is it allowed to install MC cable in an accessible ceiling, suspended lay in tiles ceiling, and not secure the MC cable between the light fixtures if the MC cable between each fixture does not exceed 6 feet? I have an installation where we have many recessed lights are to be installed and each light is only 4 feet apart, so we intend on installing MC cable between all lights and from what we are reading in NEC 330.30, none of the MC needs to be strapped – is this correct?

   Answer: Yes
   Code Reference: NEC 330.30(D)(2)

This section states that MC cable that is not more than 6 feet in length from the last point of cable support to the point of connection to luminaires or other electrical equipment and where the cable and point of connection are within an accessible ceiling, no further support is required. This section goes on to say that for the purpose of this section, Type MC cable fittings shall be permitted as a means of cable support.

7. If I have smoke detectors wired and powered by the 120 volt branch circuits, installed within a single family home, can the interconnection be completed using wireless technology, instead of the standard 3rd wire for interconnecting the smoke detectors. What about the CO detectors?

   Answer: Yes in both cases.
   Code Reference: SPS 321.09 for Smoke Alarms; SPS 321.097 for CO Detectors
   For new construction, or remodel projects that require the installation of CO and Smoke alarms, the units must be hardwired, but the interconnection can be achieved using wireless technology. All alarms must be audible, therefore each unit must have an audible alarm. All units must be interconnected.
   For additions or remodeling projects, it is best to check with the local inspector to see if the project requires the installation of Co/Smoke detectors.
   Don't forget to test your CO / Smoke Alarms monthly.

8. I have a question on destratification fans such as the big-ass fans. Is there a code that now talks about shutting them down in case of fire in an alarm condition or water flow with a sprinkler system? Something I just heard of.

   Answer: No
   Code Reference: NFPA 13; NFPA 1; IFGC
   Currently there is no code requirement for immediate shutdown of the destratification fans upon activation of alarm. The 2013 NFPA 13 the fire sprinkler Code, requires the fans to be turned off once the sprinkler water flow switch is activated so the sprinkler system can effectively put out the fire. The 2013 NFPA 13 has not yet been adopted by the State of Wisconsin, but in some cases may be enforced through the Fire Code, NFPA 1. There are times when these codes can be retroactive.

9. I recently inspected a UDC dwelling. The smoke detectors and CO detectors are installed on a low voltage ADT security system, the detectors are not equipped with audible alarms within the detectors, the installer is asking how many audible devices are needed? My answer is all of the installed detectors are required to have an audible alarm to properly notify the occupants of a fire or CO event, is this a correct statement?

   Answer: Yes
   Code Reference: SPS 321.09 for Smoke Alarms & SPS 321.097 for CO Detectors

Both sections require each alarm to be audible. Regarding the fact that the alarms are wired to the ADT proprietary alarm system, that's ok because that system must be powered by house electrical service. But be sure that this wiring configuration is compatible with the listing and instructions of the alarm manufacturers for both the smoke and CO detectors.

10. Can a PVC conduit be installed in a slab-on-grade dentist's office for an exam room if it contains a grounding conductor?

    Answer: No
    Code Reference: NEC 517.2; NEC 517.10; NEC 517.13(A)
    No, the definition for Health Care Facilities tells us that a dental exam room is included per 517.2. 517.10 tells us that the exam area of the dentist office is covered by 517 Part II. 517.13(A) requires all branch circuits serving the patient care area shall be provided with an effective ground fault current path by installation in a metal raceway system, or a cable having a metallic armor or sheath assembly. The metallic system is required to be an equipment grounding conductor per NEC 250.118.

11. Can SER aluminum cable be installed in an underground conduit from a house to feed a garage panel?

    Answer: No
    Code Reference: NEC 338.12(A)(2)
    No, SE Style R cable, also known as SER cable is a SE cable and is not permitted to be used in an underground application whether it is, or is not, installed in a raceway per 338.12(A)(2)

12. Can I use MC cable in an outside canopy at the front of a store?

    Answer: Yes if approved for the location.
    Code Reference: NEC 330.10(3) & (11)
    NEC 330.10(3) pg. 193 specifically permits the use of MC cable outdoors or indoors and (11) allows In wet locations where any of the following conditions are met:
    a. The metallic covering is impervious to moisture.
    b. A moisture-impervious jacket is provided under the metal covering.
    c. The insulated conductors under the metallic covering are listed for use in wet locations, and a corrosion resistant jacket is provided over the metallic sheath.

13. Is it acceptable to install both the Class 2 thermostat cable (CL2P) for the roof top HVAC unit and the fire alarm cable (FPLP) in the same conduit from the RTU to just below the roof? This conduit is approximately 20 inches in length, after the cables exit the conduit below the roof, they are then installed through bridal rings.

Answer: Yes
Code Reference: NEC 300.12
Since the conduit is not an installed raceway system, but is being used as a sleeve, the cabling systems are permitted to be installed in the sleeve. Once they leave the sleeve, they are required to follow the requirements in their respective code sections for installation.

14. What is the new GFCI's self-test feature all about? What does it do and does it take the place of the homeowner testing the GFCI every month?

Answer: Self describing; Follow manufacturer's instructions
Code Reference: SPS 316.110

Several manufacturers have devised a "self test" GFCI receptacle. They are designed to test themselves at factory determined intervals. If the internal self test feature does not operate properly, a flashing indicator light will come on that indicates the unit should be replaced. As far as manual testing goes, check the manufacturer's instructions.

15. In a basement, what constitutes habitable space for outlet spacing? I have an owner who only wants a strip of baseboard heat and an outlet for his flat screen TV on the wall. He said he doesn't need any other outlets. They are installing insulation in the studded out walls and then putting drywall over the studs.

Answer: This sounds like habitable space.
Code Reference: NEC 210.52(A); SPS 320.7 (UDC)
In Article NEC 210.52(A) the requirements for receptacle outlet spacing applies to every kitchen, family room, dining room, living room, parlor, library, den, sunroom, bedroom, recreation room, or similar room or area of dwelling units. SPS 320.7 in the UDC defines a "Habitable room" as any room used for sleeping, living or dining purposes, excluding such enclosed places as kitchens, closets, pantries, bath or toilet rooms, hallways, laundries, storage spaces, utility rooms, and similar spaces. It appears this space is being modified to be a family room or similar area. Therefore, the requirements for lighting, receptacle outlet, smoke and carbon monoxide detectors now need to become compliant for this room.

16. Is a receptacle required in all residential garages?

Answer: Attached Yes, Detached – only if provided with power.
Code Reference: NEC 210.52(G)(1)
The requirements for garage receptacles are provided in 210.52(G)(1). Receptacles are required in all garages attached to the dwelling. A detached garage is only required to have a receptacle if the garage is provided with power. Therefore, if the detached garage

has power for a light it also needs a receptacle. The NEC does not require receptacles in multi-family dwelling garages.

17. We have an old school building being converted to apartments. The owner wants to leave the brick on the outside walls for "effect". We need to install receptacle outlets on these walls in the bedroom and living room areas. It is nearly impossible to run floor outlets since the floor joists run in the wrong direction. Would it be possible to run surface metal raceway on the brick, and when we get to the metal studs, use fittings to transition from the surface metal raceway to MC cable?

    Answer: Yes
    Code Reference: NEC 300.15(C)
    NEC 300.15(C) pg. 142, a box or conduit body shall not be required where cables enter or exit from conduit or tubing that is used to provide cable support or protection against physical damage. A fitting shall be provided on the end(s) of the conduit or tubing to protect the cable from abrasion.

18. What size conductors are required for both a 100 amp and a 200 amp subpanel in a dwelling (additional not main power feeder panels).

    Answer: Size the conductors from NEC 310.15(B)(16)
    Code Reference: NEC 310.15(B)(7); NEC 310.15(B)(16)
    The conductor sizes ampacities listed in table 310.15(B)(7) (#4 copper & #2 aluminum for 100 amps and 2/0 copper and 4/0 aluminum for 200 amps) do not apply to secondary panels like these. This table can only be applied to the service conductors or main feeder that supplies the entire load of the dwelling. The wire size for the specified ampacity would be derived from 310.15(B)(16) #3 copper and #1 aluminum for 100 amps and 3/0 copper and 250 Kcmil aluminum for 200 amps would be required.

19. Is it acceptable to install a 100 Amp main breaker electrical panel when the meter socket is rated 60 amps?

    Answer: No
    Code Reference: NEC 110.10; NEC 230.94
    The meter socket and all upstream wiring on the service shall be selected and coordinated to clear a fault and carry an overload if those conditions occur as stated in NEC 110.10. NEC 230.94 requires the service overcurrent device to protect all circuits and devices for the service.

20. At Final Electrical Inspection my inspector said I need color code labels at my electrical panels because I have 277/480 volt and 120/208 volt electrical power in the building. I have never had to do this before, where is he getting that code?

Answer: NEC 210.5(C)(1) & (3)
Code Reference: NEC 210.5(C)(1) & (3)
NEC 210.5(C)(1) requires that Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and system at all termination, connection, and splice points.
NEC 210.5(C)(3) requires The method utilized for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment.

21. Does the NEC require a GFCI receptacle in the unfinished furnace room located within a finished basement?

    Answer: Yes
    Code Reference: NEC 210.52(G)(1) & (2)
    210.52 (G) (1) & (2) requires at least one receptacle outlet, in addition to those for specific equipment, shall be installed in each basement and here a portion of the basement is finished into one or more habitable rooms, each separate unfinished portion shall have a receptacle outlet installed in accordance with this section.

22. We forgot to order the color code fixture whips, (brown, orange, yellow) for our 277 volt fixtures. Is it ok to identify the black wire of the fixture whip with brown, orange, or yellow tape at the terminations?

    Answer: Yes
    Code Section: NEC 210.5(C)(1); Article 100 Definitions;
    NEC 210.5(C)(1) requires that Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and system at all termination, connection, and splice points. In Article 100, a branch circuit is defined as the circuit conductors between the final overcurrent device protecting the circuit and the outlet(s). The conductors in the fixture whip are considered branch circuit conductors and must be uniquely identified by line and system. Using marking tape to comply with this requirement is permitted regardless of size.
    If the conductors are supplied with the fixture they do not need to be identified with the system marking.

23. I am installing a PV system in the farm field and the strings are installed underground in a conduit to the barn. I am installing a combiner box on the outside of the barn, the combiner box has 8 fuses with the safe touch type fuseholders, will this combiner box be acceptable for the disconnect? The inspector is requiring a disconnect suitable for service equipment to be located on the outside of the barn for these PV circuits or within 8’ of

entering the barn, I am saying the combiner box is acceptable for the disconnect for the PV circuits feeding the barn.

Answer: No
Code Reference NEC 690.14 (C)(1) and NEC 690.14 (C)(1) Exception
Means shall be provided to disconnect all conductors in a building or structure from the PV system conductors. The location shall either be outside of the building or inside nearest the point of entry. The disconnect is permitted to be located remote from the point of entry if it complies with NEC 690.31(E).
The 2014 NEC 690.17(A) has some new options for the permitted types of disconnecting means. An approved petition for variance from DSPS would be required at this time to permit the use of this section.

24. A BBQ restaurant we are working on has wagon wheel lighting fixtures that were made in the old west (China). There is not a listing mark on the fixtures. Are lighting fixtures required to be listed?

Answer: Yes
Code Reference: NEC 410.6
All luminaires and lampholders shall be listed.

25. When do I need to use 2 ground rods?

Answer: Anytime a ground rod is required per NEC 250.
Code Reference: SPS 316.250(2)
According to SPS316.250(2) this is a department rule in addition to the requirements in NEC 250.53 (A) (3): A single electrode consisting of a rod, pipe or plate shall be augmented by one additional electrode of any of the types in NEC 250.52 (A) (4) to (A)(8). Though there are other options in 250(A)(4) to (A)(8), the most logical is to use two ground rods.

26. I installed a chain-hung light over my bathtub and put it on a dimmer. The inspector rejected the installation. I see lots of people with lights over their bathtubs. Why am I getting picked on?

Answer: Not permitted.
Code Reference: NEC 410.10(D)
NEC 410.10(D) requires that no parts of cord-connected luminaires, chain-, cable-, or cord-suspended luminaires, lighting track, pendants, or ceiling-suspended (paddle) fans shall be located within a zone measured 3 feet horizontally and 8 feet vertically from the top of the bathtub rim or shower stall threshold. This zone is all encompassing and includes the space directly over the tub or shower stall. Luminaires located within the actual outside dimension of the bathtub or shower to a height of 8 feet vertically from the

top of the bathtub rim or shower threshold shall be marked for damp locations, or marked for wet locations where subject to shower spray. The inspector was doing his job. This installation is not permitted.

27. An owner wants to create a recreational vehicle park. The owner wants us to put some 120 volt receptacles around this area for trailers and motor homes to plug in. He wants to put 2 duplex receptacles on each post so they can feed four units. Is this ok?

    Answer: No
    Code Reference: NEC 551.71
    NEC 551.71 requires that every recreational vehicle site with electrical supply shall be equipped with at least one 20-ampere, 125-volt receptacle. A minimum of 20 percent of all recreational vehicle sites, with electrical supply, shall each be equipped with a 50-ampere, 125/250-volt receptacle conforming to the configuration as identified in Figure 551.46(C). These electrical supplies shall be permitted to include additional receptacles that have configurations in accordance with 551.81. A minimum of 70 percent of all recreational vehicle sites with electrical supply shall each be equipped with a 30-ampere, 125-volt receptacle conforming to Figure 551.46(C). This supply shall be permitted to include additional receptacle configurations conforming to 551.81. The remainder of all recreational vehicle sites with electrical supply shall be equipped with one or more of the receptacle configurations conforming to 551.81. Dedicated tent sites with a 15- or 20-ampere electrical supply shall be permitted to be excluded when determining the percentage of recreational vehicle sites with 30- or 50-ampere receptacles. Additional receptacles shall be permitted for the connection of electrical equipment outside the recreational vehicle within the recreational vehicle park. All 125-volt, single-phase, 15- and 20-ampere receptacles shall have listed ground-fault circuit-interrupter protection for personnel. Informational Note: The percentage of 50 ampere sites required by 551.71 may be inadequate for seasonal recreational vehicle sites serving a higher percentage of recreational vehicles with 50 ampere electrical systems. In that type of recreational vehicle park, the percentage of 50 ampere sites could approach 100 percent.

28. Do I have to provide available fault current levels on a commercial service change?

    Answer: Yes
    Code Reference: NEC 110.9; NEC 110.10; NEC 110.24(A) & (B)
    NEC 110.9 & 110.10 requires the equipment to have sufficient interrupting and short circuit ratings. In order to verify this information, the installer and inspector needs to have this information available to them before doing the service change. NEC 110.24(A) requires service equipment in other than dwelling units shall be legibly marked in the field with the maximum available fault current. The field marking(s) shall include the date the fault current calculation was performed and be of sufficient durability to withstand the environment involved. This applies to both new and rewired services installations. NEC 110.24(B) states that when modifications to the electrical installation

occur that affect the maximum available fault current at the service, the maximum available fault current shall be verified or recalculated as necessary to ensure the service equipment ratings are sufficient for the maximum available fault current at the line terminals of the equipment.
The required field marking(s) in 110.24(A) shall be adjusted to reflect the new level of maximum available fault current. This would apply to modifications and service changes as well.

29. I have a new church being constructed in the City. They are installing a full body Baptismal unit that has a 120 volt cord and plug pump with a 240 volt heater. This unit will be permanently installed in a concrete floor and has a permanent drain. There is a separate area within this unit for the Pastor to walk into that is dry to perform his duties. My question is which section of Article 680 is this unit covered under? Would wiring methods in Part II of 680 need to be followed? Any help would be appreciated. Thanks.

    Answer: NEC 680 Parts I, II, & IV; Yes
    Code Reference: NEC 680.2; NEC 680.43; NEC 680.26(B)(2); NEC 680.26(C)
    First we go to NEC 680.2. A pool is defined as manufactured or field-constructed equipment designed to contain water on a permanent or semi-permanent basis and used for swimming, wading, immersion, or therapeutic purposes. A spa or hot tub is defined as a hydromassage pool, or tub for recreational or therapeutic use, not located in health care facilities, designed for immersion of users, and usually having a filter, heater, and motor-driven blower. It may be installed indoors or outdoors, on the ground or supporting structure, or in the ground or supporting structure. Generally, a spa or hot tub is not designed or intended to have its contents drained or discharged after each use. Per the pastor, this unit would not be drained after each use, only occasionally. This use is similar to a hot tub or spa. 680.43 refers to Parts I and II as applicable except as modified by part IV. NEC 680.26 (B) (2) Perimeter Surfaces. The perimeter surface shall include unpaved surfaces, as well as poured concrete surfaces and other paving. This situation deals with an indoor full body Baptismal unit which we are treating as an indoor Spa or Hot tub per NEC 680.43. The proposed walking surface surrounding the baptismal unit is wood. 680.26(B) requires that the equipotential bonding grid "extend within or under paved walking surfaces for 1 m (3 ft) horizontally beyond the inside walls of the pool". Also, 680.26(C) would require the pool water to be bonded to the perimeter bonding.

30. Does a radon fan disconnect need to be located within site of the motor?

    Answer: Yes if over 1/8 HP; No if 1/8 HP or less
    Code Reference: NEC 430.102(B); NEC 430.109(B)
    NEC 430.102(B) states the disconnect for the motor must be within sight from the motor location if the motor is greater than 1/8 HP. The branch-circuit circuit-breaker can serve

as the required disconnect but only where the motor is rated 1/8 HP or less per NEC 430.109(B).

31. Can Romex be installed in outdoor conduit? Does it comply with 334.10(A) when it is normally dry 95% of the time in most geographic locations?

    Answer: No
    Code Reference: NEC 300.9, NEC 310.10(C), Article 100 Location, Wet; NEC 334.12(B)(4)

    No, under Article 100 a wet location includes areas exposed to the weather. Section 300.9 tells us that the inside of the raceway needs to be treated as wet location and refers the user to 310.10 (C)(3) which tells us that the cable needs to be listed for a wet location. Section 334.12(B)(4) tells us that NM Cable is not permitted to be used in a wet location.
    334.10(A) tells us that NM Cable is permitted to be used exposed and concealed in dry locations.

32. I saw a cable that serves a lighting fixture in an Air Handler. Can you tell if it's plenum rated, i.e. is it okay for it to be located in the air stream?

    Answer: No.
    Code Reference: NEC 300.22(C)(1)
    This is a flexible cord Type SJOOW, which would be a violation of NEC 300.22(C)(1) which states the approved wiring methods for an environmental air plenum would consist of a metallic wiring method. Rubber cords would not be permitted.
    Listed units that employ cable or cord wiring methods are acceptable where the wiring method is installed in accordance with the listed standards.

33. I went to wire a hot tub for a customer. When I got there, it was pretty obvious it was sitting right over the underground service entrance feeding the building. I told the owner the hot tub would need to be moved or we would have to have the utility relocate the underground wiring. She said the hot tub installer didn't say anything and they do this for a living. She also indicated 2 other electricians have given her prices and they didn't say anything about this issue. Am I wrong?

    Answer No you are correct.
    Code Reference: NEC 680.40; NEC 680.10; Utility Service Rules
    NEC 680.40 indicates Spas and Hot Tubs must comply with Part I and Part IV of NEC 680. NEC 680.10 states underground wiring shall not be permitted under the pool or within the area extending 1.5 m (5 ft) horizontally from the inside wall of the pool unless this wiring is necessary to supply pool equipment permitted by this article. Where space limitations prevent wiring from being routed a distance 1.5 m (5 ft) or more from the

pool, such wiring shall be permitted where installed in complete raceway systems of rigid metal conduit, intermediate metal conduit, or a nonmetallic raceway system. All metal conduit shall be corrosion resistant and suitable for the location. The minimum cover depth shall be as given in Table 680.10. Similar clearances are found in the NESC 234 as well as the utility work rules around the State.

34. Can a cord- and -plug connected motor and receptacle be used as the disconnect for an exterior radon fan?

    Answer: Yes with conditions
    Code Reference: NEC 430.102(B); NEC 430.109(C); SPS 316.110; UL White Book
    A disconnect shall be provided for the radon mitigation fan. A properly rated snap switch in a weather-tight enclosure is one of three options permitted in NEC 430.109(C). NEC 430.109(C) permits a general use switch as the disconnect for motors 2 HP or less. The ampere-rating of the switch must be at least twice the full-load current rating of the motor. An AC-only switch must have an ampere rating of at least 125% of the motor full load current. NEC 430.109(F) permits cord and plug connection on motors as long as the attachment plug and receptacle are horsepower rated. The cord and plug is required to be listed for use in a wet location and sized properly. SPS 316.110. The 2014 UL white on page 452 can assist you in determining what makings you should look for on the cord when determining NEC compliance.

35. Do the outlets in a bathroom for plugging in LED lights have to be 20 amperes and GFCI protected?

    Answer: Yes
    Code Reference: NEC 210.11(C)(3); NEC 210.52(D); NEC 210.8(A)(1); NEC 210.70(A)(1)
    NEC 210.11(C)(3) indicates that in addition to the number of branch circuits required by other parts of this section, at least one 20-ampere branch circuit shall be provided to supply bathroom receptacle outlet(s). Such circuits shall have no other outlets. Exception: Where the 20-ampere circuit supplies a single bathroom, outlets for other equipment within the same bathroom shall be permitted to be supplied in accordance with 210.23(A)(1) and (A)(2). 210.52(D) states that in dwelling units, at least one receptacle outlet shall be installed in bathrooms within 900 mm (3 ft) of the outside edge of each basin. Also, NEC 210.8(A)(1) requires that all receptacle outlets installed in a dwelling unit bathroom must be GFCI protected. NEC 210.70(A)(1) says at least one wall switch–controlled lighting outlet shall be installed in every habitable room and bathroom. So if you have a switch controlled lighting outlet, you can add a switch controlled receptacle for "accent lighting". However, this receptacle must be 20 amperes and GFCI protected.

36. I have EMT conduit embedded in some old outside walls that are below grade. Can I sleeve NM cable through these old EMTs?

    Answer: No for an exterior concrete wall below grade
    Code Reference: NEC 334.12(B)(4); SPS 316.358
    NM cable shall not be installed in a wet or damp location per NEC 334.12(B)(4). A concrete wall below grade would be considered a damp location at best. NM cable would not be permitted to be installed in the EMT in concrete. In new installations, EMT is not permitted to be installed in concrete in an exterior concrete wall below grade per SPS 316.358.

37. I have a 24 unit apartment building with ten garages for individual parking spaces (these are for the high rent guys). Do the receptacles for these garages need GFCI protection? These spaces are not assigned to any individual unit and are fed from the house panel.

    Answer: Yes
    Code Reference: NEC 210.8(B)(8)
    NEC 210.8(B)(8) states in garages, service bays, and similar areas where electrical diagnostic equipment, electrical hand tools, or portable lighting equipment are to be used GFCI protection would be required. Since these appear to be common area garage spaces that are not assigned to a specific dwelling unit, they would be similar to those parking spaces that are in an open parking garage. However, since it is likely that hand tools and portable appliances will be used, GFCI protection is required.

38. I sized the ampacity of the conductors to a motor using the name plate rating on the motor. The inspector said that the motor conductors are the wrong size. Is he right?

    Answer: Yes
    Code Reference: NEC 430.6(A)(1)
    NEC 430.6(A)(1) says that you shall use 430. 247 248,249,250, in determining ampacity of conductors and other components for motors. Except for special motors, the nameplate amperage rating is used for sizing overload protection.

39. In a rec room area, I have a shelf that a microwave sits on that's not part of the counter top. The receptacle is within 6 ft. of the sink. Would I have to GFCI and AFCI this receptacle?

    ANSWER: Yes to both
    Code Reference: NEC 210.8(A)(7); NEC 210.12(A)
    NEC 210.8(A)(7) say any receptacle in any direction that is within 6 ft. of the sink shall be GFCI protected. One way to describe this is to use a 6' string. If you touch one end to the sink and can reach a receptacle with the other end, that receptacle needs to be GFCI

protected. Because this is not a kitchen, NEC 210.12 would apply also and the receptacle would have to be AFCI protected.

40. I have been told the low voltage wiring between the inside exit light and the emergency light is considered an emergency circuit, and therefore the wiring to the remote emergency heads must be in MC cable or a raceway. If the wiring is in a raceway to the remote heads, the wiring cannot be a CL2 wire, and that the wiring must be a Chapter 3 wiring method, is this true?

    Answer: The wiring method must be AC, MC or a raceway.
    Code Reference: SPS 316.700(1)(a)
    SPS 316.700(1)(a) requires emergency circuits to be installed in a raceway or MC or AC cable. This portion of the circuit is supplied from the battery backup on the exit/emergency light, therefore in a loss of power, this circuit is required to supply power to the emergency lights, in this case the remote heads. This would also apply in the case of an inverter which supplies multiple emergency lights, the wiring on the output side of the inverter would be classified as emergency circuits and these circuits would need to be supplied in MC or AC cable or a raceway system. There is no violation if the CL2 cable is installed in the raceway, if it is sized properly for the load, and is not prohibited by other codes or manufacturer's restrictions.

41. I have a small kitchen area without a lot of counter space. I installed a GFCI protected receptacle in the appliance garage. From there I fed the refrigerator. This is one of the kitchen appliance circuits. I installed 2 other outlets above the countertop space and that is the other kitchen appliance circuit. The inspector says the circuit in the appliance garage doesn't count, and I have to have a 2nd circuit feeding the outlets above the countertop. Most of the appliances are plugged into the appliance garage circuit. Is he right?

    Answer: Yes he is right.
    Code Reference: NEC 210.52(C)(5)
    In NEC 210.52(C)(5) receptacle outlets rendered not readily accessible by appliances fastened in place, appliance garages, sinks, or rangetops as covered in 210.52(C)(1), Exception, or appliances occupying dedicated space shall not be considered as these required outlets. The small appliance branch circuit that serves the appliance garage and refrigeration would not be a compliant 20 ampere small appliance branch circuit, so there would be only one small appliance branch circuit that would be legal for this arrangement.

42. The inspector says he won't allow this service (see photo) to be energized. What's the problem? How can I make him happy?

    Answer: Doesn't appear to have proper protection.

Code Reference: NEC 300.5(D)(1) and Table.
NEC 300.5(D)(1) requires that direct-buried conductors and cables emerging from grade and specified in columns 1 and 4 of Table 300.5 shall be protected by enclosures or raceways extending from the minimum cover distance below grade required by 300.5(A) to a point at least 2.5 m (8 ft) above finished grade. In no case shall the protection be required to exceed 450 mm (18 in.) below finished grade. Also check with the local electric utility for any rules they may have.

43. We're doing a service upgrade on an existing home built in the 80's. We are replacing the panel, meter socket and riser. The existing overhead drop clears the newly built detached garage roof by 2', is this ok? Can we use the same attachment point on the home?

    Answer: No & No
    Code Reference: PSC 114 and NEC 230.24(A)
    NEC 230.24(A) requires a minimum 3' of clearance over roofs with a 4 in 12 pitch or greater, or 8' where less than 4 in 12 pitch. An attachment point would need to be established that would provide the proper clearance over the roof depending on the pitch of the roof.

44. I am curious to know if I can consider the 0-10v signal as class 1? I would like to run the signal wires in the same raceway with the 277v lighting power. This is for an LED retrofit. Attached is the dimmer information.

    Answer Yes
    Code Reference: NEC 725.130 (A) Exception 2; NEC 725.124; NEC Chapter 9 Table 11; SPS 316.110; NEC 725.136
    NEC 725.121(A) specifies the power supply for a Class 2 or 3 circuit. NEC 725.124 requires the power source of a Class 2 or 3 circuit to be durably and plainly visible. After discussion with the manufacturer, these are Class2 circuits as described in NEC Chapter 9 Table 11. Therefore, the 0-10v signal wiring could not be installed with the 277v lighting power unless the conditions specified in NEC 725.130 (A) Exception No. 2 are met. This involves reclassifying the Class 2 circuits and installing them as Class 1 circuits in accordance to part 2 of Article NEC 725.

45. My temporary service was not approved. Who cares if it's a little rough looking, it's just a temporary.

    Answer: Temporary does not mean "forget the code".
    Code Reference: NEC 590.2(A)
    NEC 590.2(A) states, except as specifically modified in this article, all other requirements of this Code for permanent wiring shall apply to temporary wiring installations. Openings in panels, physical protection of conductors, conduit and cable

support, 2 ground rods, proper corresponding fittings, deterioration of equipment and workmanship are often issues.

46. Does a break room in an office building with a sink and counter now require GFCI protected outlets if they have a toaster and microwave plugged in on the counter?

    Answer: The breakroom is not a kitchen.
    Code Reference: NEC 210.8(B)(2) & (5)
    This area would not qualify as kitchen per NEC 210.8(B)(2). Therefore, we need to look at NEC 210.8(5) and any receptacle within 6' of the sink would require GFCI protection.

47. What type of labels do we need to provide at the service if they have a generator in the building?

    Answer: Generator location. Warning sign if generator is a separately derived system.
    Code Reference: NEC 700.7; NEC 701.7; NEC 702.7
    In each section, (A) requires that a sign shall be placed at the service-entrance equipment that indicates the type and location of the generator(s). In (B), it states that where removal of a grounding or bonding connection in normal power source equipment interrupts the grounding electrode conductor connection to the alternate power source(s) grounded conductor, a warning sign shall be installed at the normal power source equipment stating:

    WARNING
    SHOCK HAZARD EXISTS IF GROUNDING
    ELECTRODE CONDUCTOR OR BONDING JUMPER
    CONNECTION IN THIS EQUIPMENT IS REMOVED
    WHILE ALTERNATE SOURCE(S) IS ENERGIZED.

48. I have a 3 phase, 75 KVA transformer, 480 volt primary and a 120/208 volt 3 phase, 4-wire secondary. The primary overcurrent device is sized to properly protect the transformer. I would like to have the secondary side supply 2 machines, each equipped with 100 ampere main breakers within the control cabinets, and each machine is located approximately 50' from the transformer, but not near each other. Is this installation acceptable with the secondary breakers not grouped together?

    Answer: No
    Code Reference: NEC 240.21(C)
    NEC 240.21(C) limits the secondary conductors to 10' or 25' maximum length, therefore the breakers located on the machines are beyond the required length of conductor. Overcurrent devices would be required to installed within the 10' or 25' maximum length. 240.21(C)(1) requires the tap conductors to be protected by an overcurrent device and does not allow the next size up to be used. Table 450.3(B), note #2 under the table

requires: if the overcurrent protection is required (for protecting the transformer) then you are allowed to use up to 6 overcurrent devices and these devices must be grouped together. When using more than 1 overcurrent device in this installation, the multiple overcurrent devices are not allowed to exceed the value allowed for 1 overcurrent device. Since the secondary current of the transformer is 208 amperes (75 kVA / 208 x 1.732) the 2 – 100 amp breakers could be compliant. In summary, 2 overcurrent devices are allowed, the secondary conductors cannot be more than 10' or 25' in length and the devices are not required to be grouped if they devices are not providing overcurrent protection for the transformer, in other words if the transformer is properly protected on the primary side in accordance with Table 450.3(B).

49. My meter is located on my detached garage. There is no water or other grounding electrodes in the garage, so I installed two ground rods. I ran a feeder to my house. I grounded the equipment grounding conductor in the house to the metal water pipe. I then ran another grounding electrode conductor out to my detached garage and connected it the ground rods serving the garage. The inspector says I have to install two ground rods at the house. Why?

    Answer: 2 more rods are not required
    Code Reference: NEC 250.32(A); NEC 250.52(A)(1); NEC 250.53(D)(2); SPS 316.250(2)
    NEC 250.32(A) requires a building or structure that is supplied by a feeder shall have a grounding electrode system installed. NEC 250.52(A)(1) requires the metal water piping in contact with the earth for 10 feet to be utilized. NEC 250.53(D)(2) requires the water piping to be supplemented. SPS 316.250(2) requires that if using ground rods, you must install 2 ground rods. There is no distance limitation to the length of the grounding electrode conductor that would connect to the ground rods.

50. Are receptacles and lights in a finished laundry area required to be AFCI protected?

    Answer: Yes
    Code Reference NEC 210.12(A)
    A finished laundry area is similar to the rooms and spaces covered by 210.12(A). Hence AFCI protection is required. This will become clear in the 2014 NEC as laundry rooms are added to the list.

51. We're installing a new fire alarm system in an existing foodstore. Do we have to run the alarm circuit wiring in conduit?

    Answer: No.
    Code Reference: NEC 760.130; WI Act 55
    NEC 760.130 permits fire alarm circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with

760.130(A), (B), or a combination of (A) and (B). Power-limited fire alarm conductors and cables described in NEC 760.179 shall be permitted. Conduit is also always an option. 2015 WI Act 55, the budget bill, specifically prohibits local municipalities from adopting ordinances that apply to public buildings, places of employment, and are more restrictive than the State's Electric Code and National Electrical Code. This is similar to UDC dwelling code which prohibits municipalities from imposing more restrictive requirements.

52. Can I install NM cable in a groove cut in a concrete floor to feed a kitchen island?

    Answer: Maybe
    Code Reference: NEC 334.10(A)(1); NEC 334.12(B)(4); NEC 300.4(F)
    NEC 334.10(A)(1) allows NM cable to be installed for both exposed and concealed work in normally dry locations. NEC 334.12(B)(4) does not allow NM cable to be installed in wet or damp locations. If the concrete floor is not a slab on grade and the location is a dry location, this installation may be compliant. NEC 300.4(F) permits cable- or raceway-type wiring methods installed in a groove, to be covered by wallboard, siding, paneling, carpeting, or similar finish, provided it is protected by 1.6 mm (l/16 in.) thick steel plate, sleeve, or equivalent or by not less than 32-mm (l l/4-in.) free space for the full length of the groove in which the cable or raceway is installed. Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing. Exception No. 2: A listed and marked steel plate less than 1.6 mm (l/16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

53. We have a softball field with a batting fence. The manager would like a convenience outlet for an announcer table located behind said fence. Is this fence considered an appropriate structure to secure conduit to and feed the receptacle?

    Answer: Typically Yes.
    Code Reference: NEC 314.23(B); NEC 300.11(A)
    314.23(B) permits boxes to be secured to a building or other surface and requires the support to be rigid and secure. 300.11(A) requires raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place. Typically, fences around a batting area would be rigid and secure. Using proper fastening techniques would permit the receptacle and conduit to be supported to the fence.

54. Can a recessed can light be installed in a clothes closet?

    Answer: Yes with conditions.
    Code Reference: NEC 410.16(C)(3) & (4)
    NEC 410.16(C) pg. 281 allows recessed luminaires to be installed in clothes closets with the following clearances to the closet storage space as follows:

(3) 150 mm (6 in.) for recessed incandescent or LED luminaires with a completely enclosed light source installed in the wall or the ceiling.
(4) 150 mm (6 in.) for recessed fluorescent luminaires installed in the wall or the ceiling. Both types of recessed luminaires are permitted with a clearance of 6 inches to the storage space, but an incandescent or LED luminaire must have a completely enclosed light source. Fluorescent luminaires are permitted to be of the open type.

55. What are the acceptable electrical installations for a dishwasher as far as disconnecting means go (cord and plug, hardwired)?

    Answer: May be possible to do either.
    Code Reference: NEC 334.30; NEC 422.16(B)(2); NEC 422.31(B) & (C)
    NEC 334.30 requires NM cable to be secured within 12 inches of every outlet box, junction box, cabinet or fitting. If the NM cable is secured within 12 inches without causing damage, NM cable could be used. NEC 422.31(C) would require a disconnect within sight of the dishwasher. NEC 422.16(B)(2) specifically permits cord and plug connection with a flexible cord identified as suitable for the purpose in the installation instructions of the appliance manufacturer where all of the following conditions are met:
    (1) The flexible cord shall be terminated with a grounding-type attachment plug.
    Exception: A listed dishwasher or trash compactor distinctly marked to identify it as protected by a system of double insulation, or its equivalent, shall not be required to be terminated with a grounding-type attachment plug.
    (2) The length of the cord shall be 0.9 m to 1.2 m (3 ft to 4 ft) measured from the face of the attachment plug to the plane of the rear of the appliance.
    (3) Receptacles shall be located to avoid physical damage to the flexible cord.
    (4) The receptacle shall be located in the space occupied by the appliance or adjacent thereto.
    (5) The receptacle shall be accessible.
    If the Code is met, either method would be acceptable.

56. I have bus duct located 12’ above the floor with a fused disconnect for a feeder. A machine has now been installed directly under the disconnect. The machine is 48” deep by 10’ in length. Is the machine permitted to be installed under the fused disconnect?

    Answer: Yes if the bus plug is accessible by lift or portable platform
    Code Reference: NEC 110.26(A)
    NEC 110.26(A) does require proper working space to access the fusible disconnect. If the machine infringes on the required work space required to safely troubleshoot or service the fused disconnect, something would need to be moved.

57. I have an outdoor pavilion in which they would like to have lights installed and many circuits for receptacles due to the unknown types of activities which will occur at this facility. The plans call for an electrical service pedestal to be installed 25’ from the

pavilion with 20 to 30 branch circuits from the service panel to the pavilion. At this point, it appears this is 2 structures, 1 being the service and associated service panel, the 2nd structure being the pavilion. With this assumption, can we install this many circuits to a separate structure? The pavilion footing has reinforcing rods in the footings.

Answer: Yes
Code Reference NEC 225.32
You could assume this is 2 buildings or structures. However, NEC 225.32 permits the disconnecting means be installed either inside or outside the building. If installed outside the building, no specific distance between the building or structure and disconnecting means is specified. The disconnecting means shall be "within sight" of the structure(s) it serves.

58. We wired a jockey pump for the fire pump system. The conductors were properly sized to the fire pump controller so we used the 10 ft. tap rule and tapped off in the fire pump controller to a service rated disconnect for the jockey pump. The Fire Inspector said that you cannot tap off the in the controller to supply the jockey pump. I cannot find anything in the NEC that supports this. Is he correct?

Answer: Yes he is.
Code Reference: NEC 695(6)(I)(6); NFPA 20.9.7(6)
The answer is found in NEC 695(6)(1)(6) and NFPA 20 9.7 (6) which states that the fire pump controller cannot be used as a junction box to supply power for jockey pumps or other equipment associated with the fire pump system

59. I have a dwelling unit where the patio door has a 3' x 3' landing outside the door which then leads directly to a set of steps. The 3' x 3' landing is the same size as the slider portion of the patio door, so I have installed the receptacle to the side of the patio door, but outside the perimeter of the landing, the Inspector has rejected the installation, as the receptacle is not within the perimeter of the landing. Is my installation acceptable?

Answer: Yes
Code Reference: NEC 210.52(E)(3)
NEC 210.52(E)(3) reads as follows –"Balconies, decks, and porches that are accessible from inside the dwelling unit shall have at least one receptacle outlet installed within the perimeter of the balcony, deck, or porch. The receptacle shall not be located more than 61/2 feet above the balcony, deck, or porch surface". A landing is not a porch, deck or balcony. A landing is intended to solely facilitate entrance and egress to the dwelling.

60. Can the control wiring that runs from the transfer switch to the standby generator be in the same conduit as the control wiring for the optional standby power?

Answer: Yes

Code Reference: NEC 701.10
In NEC 701.10 the code states the legally required standby system wiring shall be permitted to occupy the same raceways, cables, boxes, and cabinets with other general wiring.

61. I installed a GFCI receptacle in the ceiling above a power vent water heater. The inspector says move it. I'm asking why since I can get to it with a ladder.

    Answer: The GFCI mechanism must be readily accessible.
    Code Reference: NEC 210.8; Definitions
    NEC 210.8 requires GFCI's to be readily accessible. Readily accessible is defined as capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, and so forth. There are a number of ways this could be accomplished.

62. I have a 2 unit (duplex) and the electrical inspector has rejected the service installation. I have installed 1 service disconnect inside the basement of 1 unit and the 2nd service disconnect is located outside directly under the double meter socket. The Inspector said the service disconnects must be grouped together outside or both service disconnects must be located inside each unit or occupancy.

    Answer: The disconnects must be grouped or on or in the individual dwelling units.
    Code Reference: NEC 230.40 Exception No. 1
    NEC 230.40 requires each service to supply only one set of service-entrance conductors. Exc. 1 allows a building with more than one occupancy to have one set of service entrance conductors to be run to each occupancy.

63. I have an unfinished basement which is now being finished into a rec room. The electrician has utilized an existing branch circuit which previously supplied the pull chain lights in the basement. Does this existing branch circuit for the new finished area required AFCI protection?

    Answer: No
    Code Reference: SPS 316.210(4)
    SPS 316.210(4) deletes this requirement for extensions and modifications. AFCI protection only applies to "new branch circuits" in Wisconsin and this circuit is an existing circuit. A new circuit supplying a finished area will require AFCI protection.

64. I have an UPS system which is to be installed in the critical branch of the emergency system in a hospital. This UPS system is in addition to the existing generator, so the UPS is to be wired in to supply power for the few seconds it takes for the generator to supply power to the electronics and computers connected to the critical branch. Is the UPS system required to be listed as emergency equipment?

Answer: **No**

Code Reference: SPS 316.012(1)

Typically EPS are not listed. NEC 700.5(C) requires that automatic transfer equipment, rated 600 Volts shall be listed for emergency use. If these units are listed, this would serve as evidence the UPS system was evaluated to operate in a safe and reliable manner. SPS 316.012(1) does allow the AHJ to require evaluation of this equipment. UPS equipment is evaluated to UL 1778. UPS that employ hospital grade components identified by the markings "Hospital Only", "Hospital Grade", or a green dot on the BODY of the component, or otherwise implying suitability for medical use, are further evaluated to UL 2200.

65. I have a PV system going on a single family dwellings detached garage. The question came up "does the PV circuit need a disconnect or overcurrent protection before going underground to the house"? This is an "enphase" system where the inverter is attached at the modules. I do not see where there would be a requirement for this either in NEC 690, 210 or 240.

    Answer: No if the conductors do not enter the garage.

    Code Reference: NEC 690.14(D); SPS 225(3)

    If the PV output conductors do not enter the garage, NEC 690.14(D) would have to be met where the inverter is mounted on the roof or in other than a readily accessible location. NEC 690.14(D)(2) requires a disconnecting means is required within sight of or in the inverter. In these systems, quite often the "quick connect" connectors are listed as a disconnecting means. NEC 690.14(D)(3) requires an additional disconnecting means to be installed that complies with NEC 690.13(C)(1). If the conductors do not enter the garage, a disconnecting means would not be required at the garage. At the house, there would need to be a disconnect located on the exterior or inside within 8 feet of entering the building per SPS.225(3).

66. Does the use of electric needles in a tattoo parlor change the status of the tattoo parlor to require redundant grounding?

    Answer: No

    Code Reference: NEC 517.1

    A tattoo parlor is not licensed to provide "health care". The tattoo artists are not licensed health care providers. Therefore the provisions of NEC Article 517 are not required to be applied. The State researched the issue with several other state agencies. The other states that were contacted license tattoo parlors and the artists. They do not license the facilities or artists as health care.

67. Can the pumps used to protect a generator and associated electrical gear be installed on the Legally Required System?

Answer: No
Code Reference: NEC 700.12
Protect the generator from flooding? No, not without a petition for variance. NEC 700.12 requires the owner to locate an emergency source where it is not likely to become flooded. There is no permission to put the generator in a location where flooding is likely and then put the sump pump(s) on a NEC 700 emergency distribution. If the location is accepted by the AHJ, the pumps could be supplied with from an alternate power, NEC 702, system.

68. Are receptacles required on the backside of a kitchen island facing a dining room where only cabinets support the countertop? There is no framed wall to mount a box. I read 210.52(A)(2) in a way that cabinets break wall space regardless of what side of the cabinet it is.

Answer: Yes
Code Reference: NEC 210.52(A)(2)(1) & (3)
NEC 210.52(A)(2) defines wall space as used in this section shall include the following: (1) Any space 2 feet or more in width (including space measured around corners) and unbroken along the floor line by doorways and similar openings, fireplaces, and fixed cabinets. This section does not differentiate between the side of the cabinet that has door openings and the sides that do not have openings. While this may appear to indicate receptacles would not be required on the backs of these kitchen cabinets, we must also look at NEC 210.52(A)(2)(3) which includes the space afforded by fixed room dividers, such as freestanding bar-type counters or railings. Though it is not easy to ascertain the definition of a "freestanding bar-type counter", when looking through several definitions and searching the internet the consensus appears to indicate a "free standing bar-type counter" could be located in a kitchen, dining room, family room or similar areas of a dwelling. Quite often these free standing bar-type counters have cabinets below, with countertops above. The arrangement could also have either a flat or a staggered countertop. This would indicate the receptacle spacing requirements in 210.52(A) and 210.52(A)(1) would apply to these cabinets that separate the dining room from the kitchen.

69. I will be installing unmetered MC feeders to the apartment meter banks on four different floors in an apartment building. These 120/208 volt 3-phase 4-wire feeders will be fed from a breaker to a tap box on each floor. Do the conductors in the MC need to all be the same size? Neutral and ground the same size as the phase conductors?

Answer Maybe, Maybe
Code Reference: NEC 220.61; NEC 250.122
NEC 220.61(A) permits the feeder neutral load as being the maximum unbalance load calculated between the neutral conductor and any one ungrounded conductor. NEC

220.61(B) permits an additional 70 percent demand factor to be applied to 220.61(B)(1) OR 220.61(B)(2). 220.61(B)(1) applies to a feeder or service supplying household electric ranges, wall-mounted ovens, counter-mounted cooking units, and electric dryers, where the maximum unbalanced load has been determined in accordance with Table 220.55 for ranges and Table 220.54 for dryers. 220.61(B)(2) applies to that portion of the unbalanced load in excess of 200 amperes where the feeder or service is supplied from a 4-wire, 3-phase system. The equipment grounding conductor is sized from NEC 250.122 and Table 250.122 and is sized based upon the overcurrent protective device that supplies the feeder(s). If the feeders are run in parallel, the equipment grounding conductor in each raceway or cable must be full sized based on the overcurrent device protecting the feeder(s).

70. We have an emergency generator in a 2 hour rated room. The inspector says the main gas line and the gas meters are not permitted in this room. Where did he dream this one up?

Answer: The inspector is right.
Code Reference: NFPA 110
NFPA 110.7.2 Location. 7.2.1 The EPS shall be installed in a separate room for Level 1 installations. EPSS equipment shall be permitted to be installed in this room. 7.2.1.1 The room shall have a minimum 2-hour fire rating or be located in an adequate enclosure located outside the building capable of resisting the entrance of snow or rain at a maximum wind velocity required by local building codes. 7.2.1.2 No other equipment, including architectural appurtenances, except those that serve this space, shall be permitted. 7.2.1.2 Level 1 EPSS equipment shall not be installed in the same room with the normal service equipment, where the service equipment is rated over 150 volts to ground and equal to or greater than 1000 amperes. 7.2.3 The rooms, shelters, or separate buildings housing Level 1 or Level 2 EPSS equipment shall be designed and located to minimize the damage from flooding, including that caused by the following:
(1) Flooding resulting from fire fighting
(2) Sewer water backup
(3) Similar disasters or occurrences
7.2.4 Minimizing the possibility of damage resulting from interruptions of the emergency source shall be a design consideration for EPSS equipment.
7.3 Lighting. 7.3.1 The Level 1 or Level 2 EPS equipment location(s) shall be provided with battery-powered emergency lighting. This requirement shall not apply to units located outdoors in enclosures that do not include walk-in access. 7.3.2 The emergency lighting charging system and the normal service room lighting shall be supplied from the load side of the transfer switch. 7.3.3 The intensity of illumination in the separate building or room housing the EPS for Level 1 shall be 3.0 foot-candles, unless otherwise specified by a requirement recognized by the authority having jurisdiction.

Note: The answers to these questions are the interpretation set forth by the Wisconsin Chapter International Association of Electrical Inspectors Education

Committee. These answers are subject to change by DSPS or the local Authority Having Jurisdiction.