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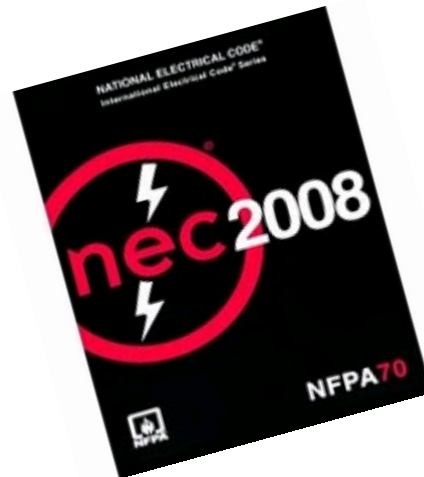
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Proposed Amendments To The 2008 National Electrical Code



Approved by
SNBO
12/10/09

Chapter 1 General

SECTION: 90.2 (B)(5)(a) Scope.

PROPOSAL: *Revise item (a) of Section 90.2 (B) (5), as follows:*

- a. Consist of service drops or service laterals, ~~and~~ associated metering and monitoring equipment, or

JUSTIFICATION: 90.2 (B) is a list of installations not covered by the NEC. Item (5) is installations under the exclusive control of a utility, and (a) lists service drop, laterals and associated metering. Companies have manufactured monitoring equipment that simply plugs into the meter socket, and then the meter plugs into the monitoring equipment. There is no wiring to inspect, the utility has to be on site to pull the meter and reset. The set-up is under the control of the utility. We added “monitoring equipment” to clarify this equipment is the electrical utility’s responsibility to regulate.

SECTION: 110.12 (C) Abandoned Conductors and Cables.

PROPOSAL: *Add a new Subsection (C) to Section 110.12, as follows:*

(C) Abandoned Conductors and Cables. For those structures regulated by the Building or Swimming Pool Code, no electrical conductors or cables shall be abandoned in place. Such conductors or cables shall be removed from the building or structure back to the panelboard unless otherwise approved by the Building Official or designated representative based upon consideration of safety and combustibility.

JUSTIFICATION: This language improves safety since abandoned conductors and cables present many safety risks. Conductors or cables left abandoned represent a safety hazard since they may inadvertently be re-energized. Due to the local high level of tenant turnover and the changes in technology which result in entire system change outs which leave abandoned systems behind, the accumulation of cables becomes more and more confusing when subsequent remodels add to the existing system. Most importantly, excessive wiring across T-bar ceilings can cause the ceiling to fail, and adds to the fire load and smoke hazard within a structure. It has been calculated and verified that 1000 Cat 6a cables each 200 feet long would be about a 90,000,000 BTU fuel load. A cord of oak is about a 20,000,000 BTU fuel load. A cord of wood is 4' w x 4' h x 8'.

SECTION: 110.12 (D) Used Materials and Equipment.

PROPOSAL: *Add a new Subsection (D) to Section 110.12, as follows:*

(D) Used Materials and Equipment. The use of used materials which meet the requirements of this code for new materials is permitted. Used equipment and devices shall not be reused unless approved by the building official.

JUSTIFICATION: This amendment is necessary to correlate with the Section 104.9.1 of the 2009 IBC, Section 104.9.1. Requiring prior permission allows us to inspect used equipment to make sure it is serviceable and safe prior to it being installed. Wear and tear of equipment is evident in this local climate and normally used equipment is not adequate for present use. Often, used equipment has been damaged or the listing requirements of the equipment have been violated. Energizing used equipment may become a life safety matter. Machinery and control panels often get moved to new locations, and we can give prior approval to re-use. Rental equipment such as power poles are allowed to be re-used provided they are properly maintained.

SECTION: 110.26 (C) (2) Large Equipment.

PROPOSAL: *Revise Section 110.26 (C) (2), as follows:*

(2) Large Equipment. For equipment rated 1200 amperes or more and over 1.8 m (6ft) wide that contains overcurrent devices, switching devices, or control devices, there shall be one entrance to and from the required working space not less than 610 mm (24 in.) wide and 2.0 m (6 ½ ft) high at each end of the working space. When more than one entrance is required by this section both entrances shall open to the exterior of the building or into an approved means of egress that is not under the control of an individual tenant.

A single entrance to and egress from the required working space shall be permitted where either of the conditions in 110.26(C)(2)(a) or (C)(2)(b) is met.

The remainder of this section remains unchanged.

JUSTIFICATION: In Electrical service equipment rooms with large services, two exits are required. We had situations where one of the required exit doors opened into a tenant space and the tenant padlocked the door to keep people out of their space. This is to correlate with the Means of Egress requirements of the 2009 IBC. The means of egress is to be clear of obstacles and cannot have locked exit access doors. Obstruction of the egress presents a life safety hazard to anyone in the electrical room.

SECTION: 110.33 (A) (1) Large Equipment.

PROPOSAL: *Revise Section 110.33 (A) (1), Large Equipment, as follows:*

(1) Large Equipment. On switchboard and control panels exceeding 1.8 m (6 ft) in width, there shall be one entrance at the end of the equipment. When more than one entrance is required by this section both entrances shall open to the exterior of the building or into an approved means of egress that is not under the control of an individual tenant. A single entrance to the required working space shall be permitted where either of the conditions in 110.33 (A)(1)(a) or (A)(1)(b) is met.

The remainder of this section remains unchanged.

JUSTIFICATION: In Electrical service equipment rooms with large services, two exits are required. We had situations where one of the required exit doors opened into a tenant space and the tenant padlocked the door to keep people out of their space. This is to correlate with the Means of Egress requirements of the 2009 IBC. The means of egress is to be clear of obstacles and cannot have locked exit access doors. Obstruction of the egress presents a life safety hazard to anyone in the electrical room.

Chapter 2 Wiring and Protection

SECTION: 210.8 (B) (6) Other Than Dwelling Units.

PROPOSAL: *Add a new Subsection (6) to Section 210.8 (B), as follows:*

(6) Food and/or beverage serving areas.

JUSTIFICATION: This amendment is for correlation with the Southern Nevada Health District requirements. The requirement was originally for commercial bars, since many had stainless steel countertops with blenders and other appliances located on them and therefore present a shock hazard. It was determined that the same shock hazard exists at buffet lines, coffee shops, juice sales, etc., so all were included as “food and /or beverage serving areas”.

SECTION: 210.23 (E) Dwelling Branch Circuits.

PROPOSAL: Add a new Subsection (E) to Section 210.23, as follows:

(E) Dwelling Branch Circuits.

(1) Maximum Number (15-ampere). The maximum number of outlets on a 15-ampere, 125 volt (nominal) luminaire lighting fixture circuit shall be twelve (12) and shall not contain general purpose outlets.

Exception No 1: Dedicated branch circuits feeding only IC rated recessed luminaires (recessed lighting fixtures) and/or low wattage energy efficient luminaires (lighting fixtures) may use Article 220.14(D) for maximum number of lighting outlets.

Exception No 2: In branch circuits serving smoke detectors the smoke detectors outlets need not be counted with the other lighting outlets.

(2) Maximum Number (20-ampere). The maximum number of outlets on a 20-ampere, 125-volt (nominal) circuit used either exclusively for receptacles, for lighting outlets or for any combination of receptacles and lighting outlets shall be twelve (12).

Exception No 1: Dedicated branch circuits feeding only IC rated recessed luminaires (recessed lighting fixtures) and/or low wattage energy efficient luminaires (lighting fixtures) may use Article 220.14(D) for maximum number of lighting outlets.

Exception No 2: In branch circuits serving smoke detectors the smoke detectors outlets need not be counted with the other lighting outlets.

(3) Individual Branch Circuits. The following fastened-in-place appliances are required to have a separate minimum 20-ampere circuit: dishwasher, trash compactor and microwave oven. The required laundry circuit may serve one (1) additional outlet in the laundry area.

JUSTIFICATION: The NEC requires that circuits be designed to not exceed 80% of capacity. A 15 ampere circuit, therefore, should not consume more than 12 amperes. 12 outlets on a circuit has proven to be reliable and continues to be the requirement. Receptacles add unknown and uncontrolled load and jeopardize the lighting of the dwelling unit to unwanted failures. Modern homes have many additional loads that were not anticipated in the past, and may cause significant additional loading. This requirement limits the loading risk on any particular circuit. This geographical area has a high ambient temperature, and circuits are often run through attics where the high heat further decreases the ampacity of the conductors. The addition of many electronic loads in concentrated areas of the home may defeat the diversification of load assumed in the NEC. This method allows for the contractor and the inspector to make sure we have circuits which are not overloaded due to the fact we don't get circuited electrical plans for residential permits. These requirements provide load diversity within the dwelling units; it has worked very well for the last two decades and eliminated the need for detailed, circuited residential plans and the need for plans checkers to verify the balanced loads at the plans check stage.

The exception #1 was made for recessed luminaires because it was for permanent light fixtures with a maximum wattage rating. We added the low wattage energy efficient luminaires that we expect to be used more in the future.

For exception #2, Smoke detectors add no appreciable load. Smoke detectors are defined as an outlet by the NEC and were being counted as part of the 12 outlets allowed.

The NEC requires dedicated circuits for fastened-in-place appliances that use more than 50% of the circuit. "210.23(A)(2)" This is an item that assists the contractors to identify the appliances listed above that generally

require more than 10 amperes and need a dedicated circuit. Rather than determining at final when the appliances are installed, we require it to be installed as a dedicated circuit and verify on the rough inspection.

SECTION: 210.52 (A) (2) Wall Space

PROPOSAL: *Revise Section 210.52 (A) (2), as follows:*

(2) The space occupied by fixed panels in exterior walls, excluding sliding panels. Where panels consist of multiple sliding panels only the first panel in each direction may be excluded.

SECTION: 210.52 (A) (2) (3) Wall Space

PROPOSAL: *Revise Section 210.52 (A)(2)(3), as follows:*

(3) The space afforded by fixed room dividers such as free standing bar-type counters or railings. Where room dividers consist of multiple moving panels only the first moving panel in each direction may be excluded as a wall space.

JUSTIFICATION: Designs of homes in southern Nevada are often extremely unique and the model codes do not anticipate these unique designs, some having openable sliding glass panels or multiple moving panels spanning up to 60 feet. These movable walls need to meet the code requirements of any other exterior wall. The NEC does not address multiple moving or sliding panels. This resulted in a lack of receptacles in rooms where the walls are normally closed the majority of the year. This is a hazard due to excessive extension cord use. These unique design features are more prevalent in Southern Nevada.

SECTION: 210.52 (B)(3) Kitchen Receptacle Requirements

PROPOSAL: *Revise Section 210.52 (B)(3), as follows:*

(3) Kitchen Receptacle Requirements. Receptacles installed in a kitchen to serve countertop surfaces shall be limited to five (5) duplex receptacles on a circuit. They shall be supplied by not fewer than two small-appliance branch circuits, either or both of which shall also be permitted to supply receptacle outlets in the same kitchen or in other rooms as specified in 210.52(B)(1). Additional small-appliance branch circuits shall be permitted to supply receptacle outlets in the kitchen and other rooms specified in 210.52(B)(1). No small-appliance branch circuit shall serve more than one kitchen.

SECTION: 210.52 (B)(3) Kitchen Receptacle Requirements

PROPOSAL: *Add a new exception to Section 210.52 (B)(3), as follows:*

Exception: Receptacles installed to provide power for electric ignition systems or clock timers for gas-fired ranges, ovens or counter-mounted cooking units.

JUSTIFICATION: The limitation on the number of outlets was relocated from 210.23 to 210.52(B)(3) with the actual countertop requirements. Appliance circuit requirements were incorporated for clarity. The number of outlets was limited due to local consumer complaints of circuits being overloaded. The limit was 4 outlets and it was increased to 5 with the 2005 NEC. The complaints have not escalated, so we are continuing with the limit of 5.

SECTION: 210.52 (F) Laundry Areas.

PROPOSAL: Add a new exception No. 3 to Section 210.52 (F), as follows:

Exception No. 3: In structures more than four (4) stories in height where the configuration of a laundry area is such that only an electrically heated stackable type washer/dryer unit utilizing 208 volt or 240 volt power can be accommodated, the receptacle may be considered as meeting the laundry circuit requirement.

JUSTIFICATION: This was added to allow the elimination of the 120 volt laundry outlet in situations where it would never be needed. It saves unnecessary wiring and especially benefits load calculations on the building electrical service size. This item was brought to the committee from our local design professionals for unique designs of condominiums incorporating stackable washers & dryers in very confined spaces.

SECTION: 210.70 (A) (1) Habitable Rooms.

PROPOSAL: Revise Item (1) in Section 210.70 (A), as follows:

(1) Habitable Rooms. At least one wall switch-controlled lighting outlet shall be installed in every habitable room and bathroom. Unless prohibited by structural design, a wall switch shall be located within 1.8 m (6 ft) of the point of entry, and shall not be located behind an active door in the fully open position.

The remainder of this section remains unchanged

JUSTIFICATION: Switch locations were addressed to provide safe access to them without stumbling through dark rooms. This language provides additional clarity to assist with consistency of enforcement and uniformity of switch installations. This provides additional life safety, and prevents falling accidents in residential occupancies by providing adequate illumination.

SECTION: 210.70 (A)(2)(a) Additional Locations.

PROPOSAL: Revise Item (a) in Section 210.70 (A)(2), as follows:

(a) At least one wall switch-controlled lighting outlet shall be installed in hallways, stairways, attached garages, and detached garages with electric power. Hallways of 3.0 m (10 ft) or more in length shall have wall switches at every end. There shall be a wall switch within 1.8 m (6 ft) of each bedroom door unless prohibited by structural design.

JUSTIFICATION: Switch locations were addressed to provide safe access to them without stumbling through dark rooms. This language provides additional clarity to assist enforcement and uniformity of switch installations. This provides additional life safety, and prevents falling accidents in residential occupancies by providing adequate illumination.

SECTION: 210.70 (A)(2)(b) Additional Locations.

PROPOSAL: *Revise Item (b) in Section 210.70 (A)(2)(b), as follows:*

(b) For dwelling units, attached garages, and detached garages with electric power, at least one wall-switch controlled lighting outlet shall be installed to provide illumination on the exterior side of outdoor entrances or exits with grade level access. A vehicle door shall not be considered as an outdoor entrance or exit. At least one wall switch that controls an interior lighting outlet shall be located at each keyed exterior entry. This switch shall be located within 1.8 m (6 ft) of the latching jamb side, unless prohibited by structural design, and not behind an active door in the fully open position.

JUSTIFICATION: Switch locations were addressed to provide safe access to them without stumbling through dark rooms. This language provides additional clarity to assist enforcement and uniformity of switch installations. This provides additional life safety, and prevents falling accidents in residential occupancies by providing adequate illumination.

SECTION: 210.70 (A) (4) Closets.

PROPOSAL: *Add a new Subsection (4) to Section 210.70 (A), as follows:*

(4) Closets. All walk-in closets or storage areas of 1.86 sq. m (20 square feet) or more in floor area shall contain a light fixture controlled by a wall switch.

JUSTIFICATION: Lights are required for safety where items on the floor could provide a tripping hazard. The floor area requirement was specified to clarify that areas smaller than 20 sq ft have adequate illumination from lighting outside the space, whereas larger areas need interior lighting.

SECTION: 210.70 (D) Self-Service Storage Facilities.

PROPOSAL: *Add a new Subsection (D) to Section 210.70, as follows:*

(D) Self-Service Storage Facilities. All ~~mini storage units~~ Self-Service Storage Facilities shall have egress illumination as required by the Building Code.

JUSTIFICATION: Clarifies that the storage units are not required to have illumination, but the common areas are required to have illumination. The main concern is providing proper illumination for a safe egress path, and this correlates with the building code.

IBC General Committee Comments: *The proposal to add a new Subsection (D) to Section 210.70 should replace the terms "Mini Storage" and "mini storage units" with "Self-Service Storage Facility", which is a term that is defined in IBC Section 1102.1 (and amended by the General Committee). This term encompasses the mini-storage units that are addressed in the proposed new Subsection (D) to NEC Article 210.70.*

SECTION: 220.84 (C) Connected Loads.

PROPOSAL: *Delete item (5) in Section 220.84(C), in its entirety.*

~~(5) The larger of the air conditioning load or the fixed electric space heating load~~

SECTION: 220.84 (D) Heating and Air Conditioning Load.

PROPOSAL: Add a new Subsection (D) to Section 220.84, as follows:

(D) Heating and Air Conditioning Load. The largest of the following six selections (load in kVA) shall be included:

- (1) 100 percent of the nameplate rating(s) of the air conditioning and cooling.
- (2) 100 percent of the nameplate rating(s) of the heat pump when the heat pump is used without any supplemental electric heating.
- (3) 100 percent of the nameplate ratings of electric thermal storage and other heating systems where the usual load is expected to be continuous at the full nameplate value. Systems qualifying under this selection shall not be calculated under any other selection in 220.84(D).
- (4) 100 percent of the nameplate rating(s) of the heat pump compressor and 65 percent of the supplemental electric heating for central electric space heating systems. If the heat pump compressor is prevented from operating at the same time as the supplementary heat, it does not need to be added to the supplementary heat for the total central space heating load.
- (5) 65 percent of the nameplate rating(s) of electric space heating if less than four separately controlled units.
- (6) 40 percent of the nameplate rating(s) of electric space heating if four or more separately controlled units.

JUSTIFICATION: The air conditioning load was removed from a load calculation which has a demand factor, and was put into a new section which requires calculations at 100%. The climate conditions here require nearly constant use of air conditioning. In previous code cycles we never allowed an alternate load calculation on multi-family dwellings. In 2005, we accepted it as per the NEC, with the minor modification that the AC load be taken at 100% due to local conditions.

SECTION: 225.32 Location.

PROPOSAL: Revise Section 225.32, in its entirety, as follows:

225.32 Location. The disconnecting means shall be installed as described in 230.70 of these amendments. For the purposes of this section the requirements in 230.6 shall be utilized.

Exception No. 1: For installations under single management, where documented safe switching procedures are established and maintained for disconnection, and where the installation is monitored by qualified individuals, the disconnecting means shall be permitted to be located elsewhere on the premises.

Exception No. 2: For buildings or other structures qualifying under the provisions of Article 685, the disconnecting means shall be permitted to be to be located elsewhere on the premises.

Exception No. 3: For towers or poles used as lighting standards, the disconnecting means shall be permitted to be located elsewhere on the premises.

Exception No. 4: For accessory buildings to one and two-family dwellings the disconnecting means may be installed either inside or on the exterior of the accessory structure.

JUSTIFICATION: Feeders to additional buildings must have their disconnecting means installed as if they were services. Especially for special use major projects, we need the disconnecting means to be readily accessible. This was requested by the Fire Departments for first responder safety. The additional language in the 2008 local amendments was to correct the inadvertent deletion of Exceptions 1-3 in the 2005 amendments.

SECTION: 230.11 Location of Customer Owned Service Lateral or Drop.

PROPOSAL: *Add a new Section 230.11 Location of Customer Owned Service Lateral or Drop, as follows:*

230.11 Location of Customer Owned Service Lateral or Drop. All conductors shall traverse only the property to be served except through recorded power easements.

JUSTIFICATION: Due to our high current demand and often high voltage demands, we commonly see customer owned services. We cannot allow them to cross property lines to install or repair those conductors. Due to local lot configurations and reclassification of property ownerships, we need this requirement to correlate with other NEC requirements. This requirement also correlates with codes governing other public utility services (such as sewer) and zoning rules.

SECTION: 230.70 General.

PROPOSAL: *Revise Section 230.70 General, in its entirety, as follows:*

230.70 General. Means shall be provided to disconnect all ungrounded service entrance conductors to a building or structure.

(A) Location. The service disconnecting means shall be installed in accordance with 230.70(A)(1), (2), (3), (4) and (5).

(1) Exterior of the Building. The service disconnecting means shall be installed in a readily accessible exterior location and within 3.7 m (12 ft.) of the building or structure. Where the distance is greater than 3.7 m (12 ft.) from the building or structure the service disconnecting means shall be considered as a separate structure.

Exception No1: A fire pump and its associated electrical equipment.

(2) Electrical Equipment Room. The service disconnecting means may be installed within a dedicated electrical equipment room with a readily accessible direct access on the exterior of a building or structure. Such rooms shall be separated from all other rooms or spaces within the building by a minimum of one (1) hour fire resistive construction and shall have approved Fire Department access.

FPN: A recessed 3200 series Knox Box may serve as the approved Fire Department access in some jurisdictions.

(3) Bathrooms. Service disconnecting means shall not be installed in bathrooms.

(4) Remote Control. Where a remote control device(s), required by another code such as in a fire command center, is used to actuate the service disconnecting means, the service disconnecting means shall be located in accordance with 230.70(A)(1) or (2). The remote control device shall be supervised by a local signaling service that causes an audible signal and illumination of an amber visual signal at the Fire Command Center and at each auxiliary location required for the Life Safety System.

(5) Emergency Systems, Information Technology Equipment and Uninterruptible Power Supplies (UPS). Emergency Systems driven by prime movers and UPS Systems shall have separate disconnecting means with separate identification. Information Technology Equipment rooms complying with Article 645.2 shall be permitted to have their disconnecting means installed per article 645.10 and 645.11 if identified at the same location as the "Service Disconnect."

(B) Marking. Each service disconnecting means shall be marked with a sign(s). When located in a dedicated electrical room the exterior door(s) providing access to the disconnecting means located in a dedicated electrical room shall be permanently marked with a sign(s). Each sign shall be a minimum 0.093sq.m (1 sq. foot), colored yellow with 25.4mm (1 inch) high, 6.35 mm (¼ inch) stroke raised or engraved letters and/or numbers indicating

the address or unit it serves and be identified as the "Electrical Service Disconnect(s)" and/or "Electrical Service Disconnect(s) Inside." Emergency Systems disconnects shall be permanently marked with sign(s), identified as "Emergency Electrical Disconnect(s)" and/or "Main Emergency Electrical Disconnect(s) Inside." When the service disconnecting means is located inside a dedicated electrical room and it is not the first service disconnect encountered or there are multiple service disconnects there shall be a directional 75mm (3inch) wide painted yellow stripe on the floor from the entry door(s) to each service disconnect. Other durable means of identification may be used with prior approval by The Authority Having Jurisdiction.

***Exception:** One and two family dwelling units and their associated accessory structures.*

(C) Suitable for Use. Each service disconnecting means shall be suitable for the prevailing conditions. Service equipment installed in hazardous (classified) locations shall comply with the requirements of Articles 500 through 517.

JUSTIFICATION: Service conductors have no overcurrent protection ahead of the service. Any fault of the conductor will continue to arc and burn. It is necessary to keep the service conductors outside the building or in a rated room, separating a fire from the rest of the building. This language provides additional safety for first responders when they need to access a disconnecting means during a fire or other emergency. This language was developed with the assistance of representatives from the Fire Departments in the Valley.

Marking or labeling is required by code, but the weather conditions here in Southern Nevada require special attention to durability. This correlates with the requirements for service disconnect locations and allows first responders to easily and quickly identify and locate the disconnecting means.

The Fire Department will normally report directly to the fire command center and control the power from that location. In the past, we have found that the shunt trip failed to operate. Due to the importance of this system working properly, we added supervision to the circuit to ensure that any failures would be found and repaired before an emergency situation occurred. This language correlates with International Building and Fire Codes.

SECTION: 230.202 (C) Conductors Considered Outside the Building.

PROPOSAL: Add a new Subsection (C) to Section 230.202, Service Entrance Conductors, as follows:

(C) Conductors Considered Outside the Building. Service-entrance conductors shall be installed in accordance with Article 230.6.

JUSTIFICATION: High voltage conductors without overcurrent protection, installed within buildings, need to be encased in concrete for fire protection. Service conductors over 600 volts are a common occurrence in Southern Nevada.

SECTION: 230.205 (A) Location.

PROPOSAL: Revise Section 230.205(A), in its entirety, as follows:

(A) Location. The service disconnecting means shall be installed in accordance with 230.70. Facilities on private property, under single management with a Life Safety System, Fire Command Center and 24 hour on-site qualified maintenance personnel shall be permitted to utilize a remote control device for their power disconnecting means. The main electrical room is not required to be located on the exterior of the building or other structure.

JUSTIFICATION: This was added to allow major projects to install their service equipment in rooms that do not open to the outside or are not at grade level, due to structural problems. This language is necessary due to the types of construction prevalent in Southern Nevada.

SECTION: 230.205 (C) Remote Control.

PROPOSAL: *Revise Section 230.205(C), as follows:*

(C) Remote Control. For multi-building, industrial installations under single management, the service disconnecting means shall be permitted to be located at a separate building or structure. In such cases, the service disconnecting means shall be permitted to be electrically operated by a readily accessible, remote-control device. The remote control device shall be supervised by a local signaling service that causes an audible signal and the illumination of an amber visual signal at the Fire Command Center and at each auxiliary location required for the Life Safety System.

JUSTIFICATION: The fire department will normally report directly to the fire command center and control the power from that location. In the past, we have found that the shunt trip failed to operate. Due to the importance of this system working properly, we added supervision to the circuit to ensure that any failures would be found and repaired before an emergency situation occurred. This language correlates with Building and Fire Codes.

SECTION: 240.6 (B) Adjustable-Trip Circuit Breakers.

PROPOSAL: *Revise Section 240.6 (B), as follows:*

(B) Adjustable-Trip Circuit Breakers. The rating of adjustable-trip circuit breakers having external means for adjusting the current setting (long-time pickup setting), ~~not meeting the requirements of 240.6(C),~~ shall be the maximum setting possible.

SECTION: 240.6 (C) Restricted Access Adjustable-Trip Circuit Breakers.

PROPOSAL: *Delete Subsection (C) of Section 240.6, in its entirety.*

~~**(C) Restricted Access Adjustable-Trip Circuit Breakers.** A circuit breaker(s) that has restricted access to the adjusting means shall be permitted to have an ampere rating(s) that is equal to the adjusted current setting (long-time pickup setting). Restricted access shall be defined as located behind one of the following:~~

- ~~(1) Removable and sealable covers over the adjusting means~~
- ~~(2) Bolted equipment enclosure doors~~
- ~~(3) Locked doors accessible only to qualified personnel~~

JUSTIFICATION: Due to the ability of service personnel to adjust the circuit breakers above their initial setting, this language was deleted in order to insure that the conductors are sized to meet the maximum current setting. Due to the prevalence of local installations with large current ratings, this is necessary language to prevent overloaded conductors and fires.

SECTION: 240.86 Series Ratings.

PROPOSAL: *Revise Section 240.86, as follows:*

240.86 Series Ratings. Where a circuit breaker is used on a circuit having an available fault current higher than the marked interrupting rating by being connected on the load side of an acceptable overcurrent device having a higher rating, the circuit breaker shall meet the requirements specified in (A) or (B), and (C). All of the information including manufacturers and part numbers of each component making up the series combination rating shall be provided on the submittal drawings for plans examination and permit. Only those manufacturers and part numbers shall be permitted for the installation.

JUSTIFICATION: This required information is necessary to be listed on the plans for the inspector to be able to verify compliance that all components are part of the listed system. This was a multi-jurisdictional request from both the plans examiners and field inspectors to insure that components of series-rated systems were installed per the approved design.

SECTION: 250.32 (A) Grounding Electrode.

PROPOSAL: *Revise Section 250.32 (A), as follows:*

(A) Grounding Electrode. For the purposes of this section all buildings or structures not joined by a continuous concrete foundation or footing and roof shall be considered as separate buildings or structures. Building(s) or structure(s) supplied by feeder(s) or branch circuit(s) shall have a grounding electrode system installed in accordance with Part III of Article 250. The grounding electrode conductor(s) shall be connected in accordance with 250.32 (B) or (C). Where there is no existing grounding electrode, the grounding electrode(s) required in 250.50 shall be installed.

JUSTIFICATION: This was for clarification of what is considered as a separate building and for correlation with the building code. The building code considers a continuous roof structure as a single building, whereas the electrical system requires a continuous equipotential grounding system (such as a concrete foundation or footing) to maintain electrical grounding continuity.

SECTION: 250.50 Grounding Electrode System.

PROPOSAL: *Revise Section 250.50, as follows:*

250.50 Grounding Electrode System. All grounding electrodes as described in 250.52(A)(1) through (A)(7) that are present at each building or structure served shall be bonded together to form the grounding electrode system. Where none of these grounding electrodes exist, one or more of the grounding electrodes specified in 250.52(A)(4) through (A)(8) shall be installed and used. The concrete-encased electrode described in Article 250.52(A)(3) shall be required for new buildings and structures that are supplied with electrical power and have concrete foundations or footings.

Exception: Concrete-encased electrodes of existing buildings or structures shall not be required to be part of the grounding electrode system where the steel reinforcing bars or rods are not accessible for use without disturbing the concrete.

JUSTIFICATION: Concrete-encased electrodes are necessary due to the southern Nevada soil conditions. This correlates with the requirements for this type of grounding electrode and provides for the grounding of accessory buildings.

SECTION: 250.52 (A) (5) Rod Electrodes.

PROPOSAL: Revise Item (5) of Section 250.52(A), in its entirety, as follows:

(5) Rod Electrodes. Rod electrodes shall not be less than 2.44 m (8 ft) in length and shall consist of the following materials and shall be installed according to Article 250.53 (G). Electrodes shall be copper clad or their equivalent and shall not be less than 15.875 mm (5/8 in.) in diameter, or listed non-ferrous rods or their equivalent and not less than 12.7 mm (1/2 in.) in diameter.

SECTION: 250.52 (A) (7)

PROPOSAL: Delete Item (7) of Section 250.52(A), in its entirety and renumber the subsequent items sequentially, as follows:

~~(7) Plate Electrodes.~~ This entire item is deleted

~~(8) (7) Other Local Metal Underground Systems or Structures.~~

The remainder of this section remains unchanged

JUSTIFICATION: This section was re-written, eliminating references to pipe (galvanized conduit) and plate electrodes (galvanized conduit) which will not withstand the soil conditions here. Pipe and plate electrodes were also deleted in 250.53 and 250.56.

SECTION: 250.53(A) Rod, Pipe, and Plate Electrodes.

PROPOSAL: Revise Section 250.53(A), as Rod Electrodes, as follows:

(A) Rod, Pipe, and Plate Electrodes. Where practicable, rod, pipe, and plate electrodes shall be embedded below permanent moisture level. Rod, pipe, and plate electrodes shall be free from nonconductive coatings such as paint or enamel.

SECTION: 250.53(B) Electrode Spacing.

PROPOSAL: Revise Section 250.53(B), as follows:

(B) Electrode Spacing. Where more than one of the electrodes of the type specified in 250.52(A)(5) or (A)(7) are used, each electrode of one grounding system (including that used for air terminals) shall not be less than 1.83 m (6 ft) from any other electrode of another grounding system. Two or more grounding electrodes that are bonded together shall be considered a single grounding electrode system.

SECTION: 250.53 (D) (2) Supplemental Electrode Required.

PROPOSAL: Revise Section 250.53(D) (2), as follows:

(2) Supplemental Electrode Required. A metal underground water pipe shall be supplemented by an additional electrode of a type specified in 250.52(A)(2) through (A)(8)(7). Where the supplemental electrode is a rod, pipe, or plate type, it shall comply with 250.56. The supplemental electrode shall be permitted to be bonded to the grounding electrode conductor, the grounded service- entrance conductor, the nonflexible grounded service raceway, or any grounded service enclosure.

Exception: The supplemental electrode shall be permitted to be bonded to the interior metal water piping at any convenient point as covered in 250.52(A)(1), Exception.

SECTION: 250.53 (E) Supplemental Electrode Bonding Connection Size.

PROPOSAL: *Revise Section 250.53(E), as follows:*

(E) Supplemental Electrode Bonding Connection Size. Where the supplemental electrode is a rod, ~~pipe, or plate~~ electrode, that portion of the bonding jumper that is the sole connection to the supplemental grounding electrode shall not be required to be larger than 6 AWG copper wire or 4 AWG aluminum wire.

SECTION: 250.53 (G) Rod and Pipe Electrodes.

PROPOSAL: *Revise Section 250.53(G), as follows:*

(G) Rod and Pipe Electrodes. The electrode shall be installed such that at least 2.44 m (8 ft) of length is in contact with the soil. It shall be driven to a depth of not less than 2.44 m (8 ft) except that, where rock bottom is encountered, the electrode shall be driven at an oblique angle not to exceed 45 degrees from the vertical or, where rock bottom is encountered at an angle up to 45 degrees, the electrode shall be permitted to be buried in a trench that is at least 750 mm (30 in.) deep. The upper end of the electrode shall be flush with or below ground level unless the aboveground end and the grounding electrode conductor attachment are protected against physical damage as specified in 250.10.

SECTION: 250.53 (H) Plate Electrodes.

PROPOSAL: *Delete Subsection (H) of Section 250.53, in its entirety.*

~~**(H) Plate Electrode.** Plate electrodes shall be installed not less than 750 mm (30 in.) below the surface of the earth.~~

JUSTIFICATION: This section was re-written, eliminating references to pipe (galvanized conduit) and plate electrodes (galvanized conduit) which will not withstand the soil conditions here. Pipe and plate electrodes were also deleted in 250.52 and 250.56.

SECTION: 250.56 Resistance of Rod, Pipe and Plate Electrodes.

PROPOSAL: *Revise Section 250.56, as follows:*

250.56 Resistance of Rod, Pipe, and Plate Electrodes. A single electrode consisting of a rod, ~~pipe, or plate~~ that does not have a resistance to ground of 25 ohms or less shall be augmented by one additional electrode of any of the types specified by 250.52(A)(4) through (A)(8). Where multiple rod, ~~pipe, or plate~~ electrodes are installed to meet the requirements of this section, they shall not be less than 1.8 m (6 ft) apart.

FPN: The paralleling efficiency of rods longer than 2.5 m (8 ft) is improved by spacing greater than 1.8 m (6 ft).

JUSTIFICATION: This section was re-written, eliminating references to pipe (galvanized conduit) and plate electrodes (galvanized conduit) which will not withstand the soil conditions here. Pipe and plate electrodes were also deleted in 250.52 and 250.53.

SECTION: 250.94 Bonding for Other Systems

PROPOSAL: Add new items (4) and (5) to Section 250.94, as follows:

(4) A set of listed terminals connected to the concrete-encased electrode as defined in Article 250.52(A)(3).

(5) A set of listed terminals connected to the concrete-encased electrode conductor as defined in Article 250.24(D), 250.30(A)(3), 250.30(A)(4), 250.30(B)(1) and 250.32(E).

JUSTIFICATION: The code requires a separate grounding terminal block outside the service panel for low voltage systems. We added that it could be connected to the grounding electrode or grounding electrode conductor for clarification of code intent. Standard practice here is to connect to the concrete-encased electrode with an additional clamp. This amendment allows the use of listed equipment that was not available when the 2008 NEC was published. This correlates with the local code requirement for a concrete-encased electrode. This allows utility providers to access the bonding connection without endangering personnel.

SECTION: 250.120 (D) Equipment Grounding Conductor.

PROPOSAL: Add a new Subsection (D) to Section 250.120, as follows:

(D) Equipment Grounding Conductor. All raceways installed on roofs shall contain an equipment grounding conductor sized per Table 250.122 installed with the circuit conductors.

Exception No. 1: Low voltage, communication and similar type systems unless required elsewhere in the Code.

Exception No. 2: As permitted by Article 250.86 for short sections of metal enclosures or raceways.

JUSTIFICATION: Due to the southern Nevada dry climatic conditions, many conduits are installed on rooftops. These raceways on easily accessible roofs are commonly damaged and disconnected at the connectors/fittings. It is not safe to rely on the raceway as our equipment grounding conductor.

SECTION: 250.122 Table 250.122 Minimum Size Equipment Grounding Conductors for Grounding Raceway and Equipment

PROPOSAL: Revise the minimum aluminum or copper-clad aluminum wire size for a 4000 amp overcurrent device, as follows:

<i>Rating or Setting of Automatic Overcurrent Device in Circuit Ahead of Equipment, Conduit, etc., Not Exceeding (Amperes)</i>	<i>Size (AWG or kcmil)</i> <i>Copper</i>	<i>Size (AWG or kcmil)</i> <i>Aluminum or Copper-Clad Aluminum*</i>
4000	500	800 750

JUSTIFICATION: The size of the aluminum EGC specified in Table 250.122 for a 4000 amp OCD is incorrectly sized. This has caused confusion for local installations with 4000 amp services. According to ICEA Standard #P-32-382-1999, the equivalent size aluminum EGC required to carry the same amount of fault current for the same amount of time for equivalent insulation types as a 500 kcmil copper conductor would be a 750 kcmil aluminum conductor. This size aluminum EGC is also the most generally chosen substitution size for a 500 kcmil copper conductor since it carries more current according to Table 310.16. In addition, 750 kcmil aluminum conductors are an industry standard size, whereas 800 kcmil is not. This proposal has been accepted on the national level by CMP-5 in the ROP meetings.

Chapter 3 Wiring Methods and Materials

SECTION: 310.15(B)(2)(c) Conduits Exposed to Sunlight on Rooftops.

PROPOSAL: *Revise Section 310.15(B)(2)(c), as follows:*

(c) *Conduits Exposed to Sunlight on Rooftops.* Where conductors or cables are installed in conduits exposed to direct sunlight on or above rooftops, ~~the adjustments shown in Table 310.15(B)(2)(c) shall be added to the outdoor temperature to determine the applicable ambient temperature for application of the correction factors in Table 310.16 and Table 310.18.~~ one of the following conditions shall be met:

(1) All conductors shall have an insulation rating of 90°C and the conduits shall be installed at least 3” above the roof surface.

(2) The adjustment factors shown in table 310.15(B)(2)(c) shall be added to the outdoor temperature to determine the applicable ambient temperature for application of the correction factors in table 310.10 and table 310.18.

FPN: One source for the average ambient temperatures in various locations is the ASHRAE Handbook — *Fundamentals*.

JUSTIFICATION: This code requirement has been added in due to research of the Copper Development Association (CDA). They funded the research and produced volumes of data about the heating of conduits on rooftops, however they have not completed the research and to date have had no wiring method fail. However they were able to get code adoption of additional requirements to apply to conduits on rooftops. If a contractor, engineer or inspector has to deal with a conduit installed on the roof they may be facing up to four different calculations in order to verify the proper size conductors were utilized. Our local climate is some of the most severe in the country and we haven't seen any failures of wiring methods installed on roof tops due to high temperature. (The damage is done by physical damage to the conduit system). However this is a code requirement and to not lessen the code we have added an alternate method, which falls within the formulas from CDA, and provides a clear installation method to the contractors and a easily verified system for the inspectors to inspect. This method was verified by using the information from CDA and providing modeling of loads on 90° C wiring methods. After checking with the panel members it was generally agreed that the code as written was going to be ignored due to its difficulty, the additional language we've added was agreed upon as an enforceable method to get compliance.

SECTION: 314.24 Minimum Depth of Boxes for Outlets, Devices, and Utilization Equipment.

PROPOSAL: *Revise Section 314.24, as follows:*

314.24 Minimum Depth of Boxes for Outlets, Devices, and Utilization Equipment. Outlet and device boxes shall have sufficient depth to allow equipment installed within them to be mounted properly and with sufficient clearance to prevent damage to conductors within the box. All boxes for outlets, devices, utilization equipment or junction boxes less than 200 mm (8 inches) in any dimension, shall have no more than two extension boxes or one extension box and one plaster ring.

Exception: Listed unit(s) or assembly(s).

JUSTIFICATION: The local propensity for frequent remodels and the additions of walls and other structural components made it common for the addition of extension after extension on boxes. Stacking of outlet boxes makes it unsafe to reach into the depth of the boxes to make splices or perform other necessary work, and resulted in damaged wire by not providing adequate access to the point of conduit entry into the box. The wording was adjusted in this code cycle for clarification of code intent.

SECTION: 352.10 (I) Exposed to Direct Sunlight.

PROPOSAL: *Add a new Subsection (I) to Section 352.10, as follows:*

(I) Exposed to Direct Sunlight. Rigid non-metallic conduit shall be a minimum Schedule 80 and identified for such use.

JUSTIFICATION: Due to the high number of hours of UV exposure, as well as the intensity of the UV levels in southern Nevada, rigid non-metallic conduit must be suitable for our local environmental conditions.

SECTION: 358.12 Electrical Metallic Tubing: Type EMT, Uses Not Permitted.

PROPOSAL: *Add new items (7), (8) and (9) to Section 358.12, Uses Not Permitted, as follows:*

(7) Embedded within concrete or masonry in contact with earth.

(8) Underground installations.

(9) Within earth fills.

JUSTIFICATION: Due to local soil conditions, electrical metallic tubing (which is only provided with an enamel coating on the inside) will deteriorate rapidly.

Chapter 5 Special Occupancies

SECTION: 514.11 (A) General.

PROPOSAL: *Revise Section 514.11(A), as follows:*

(A) General. Each circuit leading to or through dispensing equipment, including equipment for remote pumping systems, shall be provided with a clearly identified and readily accessible switch or other acceptable means, located remote from the dispensing devices, to disconnect simultaneously from the source of supply, all conductors of the circuits, including the grounded conductor, if any. Single-pole breakers utilizing handle ties shall not be permitted. The switch shall be a momentary contact type. The disconnect station sign shall be 0.093 sq. m (1 ft square), colored yellow and have black, 25.4 mm (1 inch) high, 6.35 mm (¼ inch) stroke permanent lettering describing it as "Emergency Pump Shutoff".

JUSTIFICATION: This describes the signage required due to local environmental conditions and Fire Department coordination, and that it applies to all service stations.

Chapter 6 Special Equipment

SECTION: 600.41 (D) Protection.

PROPOSAL: *Revise Section 600.41(D), as follows:*

(D) Protection. Field-installed skeleton tubing shall not be subject to physical damage. Where the tubing is readily accessible to other than qualified persons, field-installed skeleton tubing shall be provided with suitable guards or protected by other approved means. Installations less than 2.44 m (8 ft.) above finished grade or floor level shall be considered as readily accessible.

JUSTIFICATION: Southern Nevada has such a large degree of lighting in use even in locations accessible to the public, that protection was needed for their safety. The 2008 NEC now includes our original amendment, but did not give a specific height. This amendment provides clear direction to local installers.

SECTION: 682 Natural and Artificially Made Bodies of Water.

PROPOSAL: *Delete Section 682 in its entirety.*

JUSTIFICATION: In discussion with some code officials we are unable to enforce the requirements of this code as written.

SECTION: 690.14 (C) (1) Location.

PROPOSAL: *Delete the exception and revise Section 690.14(C) (1), as follows:*

(1) Location. The photovoltaic disconnecting means and overcurrent device shall be installed at a readily accessible location either on the outside of a building or structure or inside nearest the point of entrance of the system conductors before any system conductors enter the building or structure.

~~Exception: Installations that comply with 690.31(E) shall be permitted to have the disconnecting means located remote from the point of entry of the system conductors.~~

The photovoltaic system disconnecting means shall not be installed in bathrooms.

JUSTIFICATION: These unique designs of photovoltaic systems require the disconnecting means to also be on the outside of the buildings, just like the requirements for service conductors; this is again a life safety matter for our Fire Departments and Electrical Utility personnel.

Chapter 7 Special Conditions

SECTION: 700.1 Scope.

PROPOSAL: *Revise Section 700.1 Scope, as follows:*

700.1 Scope. For the purposes of this section items considered as meeting the requirements for high rise applications (i.e. buildings with an occupied floor located more than 55 feet (22 860 mm) above the lowest level of fire department vehicle access to be placed on the emergency distribution system may include: Emergency illumination, exit signage, electric fire pumps, fire jockey or makeup pumps, fire alarm equipment, smoke control equipment, one elevator per bank of elevators, cooling and heating equipment for emergency electrical rooms and elevator machine rooms, FAA required obstruction lighting, battery chargers for emergency generating equipment, heating equipment for freeze protection of fire sprinkler systems, telecommunications equipment (i.e. for 911 applications) fire command center loads such as monitoring and display equipment and other equipment approved by the Authority Having Jurisdiction that will enhance the survivability of life safety systems.

The provisions of this article apply to the electrical safety of the installation, operation, and maintenance of emergency systems consisting of circuits and equipment intended to supply, distribute, and control electricity for illumination, power, or both, to required facilities when the normal electrical supply or system is interrupted.

Emergency systems are 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.

JUSTIFICATION: Southern Nevada has a large number of high rise buildings or high occupancy buildings and designed with very complex and unique emergency electrical systems. Emergency electrical systems are typically sized to handle the total load and need to be allowed to share the same raceways. We needed to be able to classify them as emergency systems to allow combined wiring methods.

SECTION: 700.9 Fire Protection.

PROPOSAL: *Revise Section 700.9(D), as follows:*

(D) Fire Protection. Emergency systems shall meet the additional requirements in 700.9(D)(1) and (D)(2) in assembly any occupancies occupancy(s) of 300 or more for not less than 1000 persons or in buildings with an occupied floor located more than 55 feet (22 860 mm) above the lowest level of fire department vehicle access, above 23 17 m (75ft) (55 ft) in height, with any of the following occupancy classes: assembly, educational, residential, detention and correctional, business, and mercantile.

JUSTIFICATION: This defines the 55 foot height or over 300 person occupancy as the triggers to qualify for the need of emergency systems. The emergency systems are required to be in a dedicated room. This correlates with the Southern Nevada amendments to the IBC, and this correlates with the ability of emergency response to safely evacuate the building.

SECTION: 700.9 (D) (2) Feeder-Circuit Equipment.

PROPOSAL: *Add a new exception and amend Section 700.9 (D) (2), as follows:*

(2) Feeder-Circuit Equipment. Equipment for feeder circuits (including transfer switches, transformers, and panelboards) shall be located either in spaces fully protected by approved automatic fire suppression systems (including sprinklers, carbon dioxide systems) or in spaces with a 1-hour fire resistance rating. This equipment shall be located in room(s) dedicated to this equipment.

Exception: System components described in Article 701 may occupy the same dedicated room(s) as emergency systems.

FPN: For the definition of *Occupancy Classification*, see Section 6.1 of NFPA 101-2006, *Life Safety Code*.

JUSTIFICATION: Separation of the two electrical systems is required to provide higher level of reliability for our life safety electrical systems due to the unique type of occupancies in this area.

SECTION: 700.12 General Requirements.

PROPOSAL: *Revise Section 700.12, as follows:*

700.12 General Requirements. Current supply shall be such that, in the event of failure of the normal supply to, or within the building or group of buildings concerned, emergency lighting, emergency power, or both shall be available within the time required for the application but not to exceed 10 seconds. The supply system for emergency purposes, in addition to the normal services to the building and meeting the general requirements of this section, shall be one or more of the types of systems described in 700.12(A) through (E). Unit equipment in accordance with 700.12(F) shall satisfy the applicable requirements of this article.

In selecting an emergency source of power, consideration shall be given to the occupancy and the type of service to be rendered, whether of minimum duration, as for evacuation of a theater, or longer duration, as for supplying emergency power and lighting due to an indefinite period of current failure from trouble either inside or outside the building.

Equipment shall be designed and located so as to minimize the hazards that might cause complete failure due to flooding, fires, icing, and vandalism.

Equipment for sources of power as described in 700.12(A) through 700.12(E) where located within assembly occupancies for greater than 1000 persons or in buildings above 23 m (75 ft) shall meet the following additional requirements in any occupancy(s) of 300 or more persons or in buildings with an occupied floor located more than 55 feet (22 860 mm) above the lowest level of fire department vehicle access. ~~with any of the following occupancy classes assembly, educational, residential, detention and correctional, business, and mercantile~~ This equipment shall be installed either in spaces fully protected by approved automatic fire suppression systems (sprinklers, carbon dioxide systems and so forth) or in spaces protected by a fire-rated assembly listed to achieve a minimum fire rating of one-hour.

FPN No. 1: For the definition of *Occupancy Classification*, see Section 6.1 of NFPA 101-2006, *Life Safety Code*.

FPN No. 2: Assignment of degree of reliability of the recognized emergency supply system depends on the careful evaluation of the variables at each particular installation.

JUSTIFICATION: The language in the NEC is too vague for the variety of buildings being constructed in this area. In order to address the many questions from installers and designers, this language was extensively re-written to clarify the intent of the code and to provide consistency in code interpretation and enforcement for both inspectors and industry.

SECTION: 700.12 (B)(7) Generator Set.

PROPOSAL: Add a new Subsection (7) to Section 700.12 (B), as follows:

(7) The emergency generator shall not be located more than 55 feet (22 860 mm) above the lowest level of fire department vehicle access. When the generator set is located inside a building it shall be located in a room dedicated to the Emergency Power Supply System. This room shall be separate from the interior of the building by a minimum of two-hour resistive construction or shall be in room(s) fully protected by approved automatic fire suppression systems. Unless otherwise required by Building Codes openings for generator cooling and exhaust shall not be required to be fire-resistive construction.

When a generator set is located within 1.5 m (5 ft) of a building it shall be separated from the building with a rated separation wall equal to the highest fire rating within the building that has no openings. It shall be isolated within an enclosure and protected from physical damage.

When a generator set is located more than 1.5 m (5 ft) from a building it shall be isolated within an enclosure and protected from physical damage.

JUSTIFICATION: The language in the NEC is too vague for the variety of buildings being constructed in this area. In order to address the many questions from installers and designers, this language was extensively re-written to clarify the intent of the code and to provide consistency in code interpretation and enforcement for both inspectors and industry.