Photovoltaic Inspection Checklist – Field Review
2017 Edition National Electrical Code

General Requirements

- Verify installation conforms to permit package and submittals
- Installation performed by qualified personnel and electrical work performed by licensed electricians
- Equipment listed for the PV application and interconnection
- Where multiple PV systems are located remotely from each other, there is a directory present at each PV System disconnecting means
- Building penetrations sealed
- Equipment installed in a neat and workmanlike manner

Circuit Sizing and Current – 690.8

- Overcurrent Protection
  - Not required for circuits sized for the highest available current
  - Required for three or more parallel connected strings
    - Unless ISC from all sources doesn't exceed conductor and PV ocpd rating
- Overcurrent Device Ratings
  - If used in DC PV circuits shall be listed for use in PV systems
- PV Source and Output Circuits OCPD, if used:
  - Placed in the same polarity on each string
  - Shall be accessible, not required to be readily accessible

Interactive inverter locations:

- Permitted to be mounted in not readily accessible locations - 705.70. Requirements:
  - DC Disconnect mounted within sight of inverter
  - AC Disconnect mounted within sight of inverter
  - Additional AC Disconnect complying with 705.22
  - Plaque Installed in accordance with 705.10

PV *System* Disconnecting Means – 690.13

- Means provided to disconnect PV system from all other wiring systems
  - Refer to definition and diagram of different "PV System Disconnecting Means" locations. This can change based on if the system is Utility Interactive, Multimode, or Stand-alone – 690.2
- Installed at readily accessible location
- If connected to supply side of service disconnecting means: shall be suitable for use as Service Equipment
- Sufficient for maximum circuit current, available fault current, and rated voltage
- Type
  - Simultaneous disconnection of PV system conductors from other wiring systems
  - ***DC*** PV system disconnect shall be marked for use in PV systems or suitable for backfeed
  - If marked "line" and "load" shall not be permitted for backfeed/reverse current
    - This applies to disconnecting means. Follow equipment listing. 110.3(B)
  - DC rated switches and low-voltage power circuit breakers are permitted for backfeed

Electric Power Production Sources Disconnection

- Means provided to disconnect all ungrounded conductors of an electric power production source from all other conductors – 705.20
- Readily accessible and able to disconnect interactive system from all wiring systems – 705.23

Electric Power Production Sources Disconnect Device for Ungrounded Conductors – 705.22

- A manual or power operated switch or breaker that:
  - Readily accessible
  - Externally operable without exposing operator to live parts. If power operated, can be opened by hand in case of a power failure
  - Plainly indicate whether it is off or on
  - Rated for maximum current, available short-circuit current, and voltage at terminals
  - If line and load could be energized in open position, labeled in accordance with 690.13(B)
  - Simultaneously disconnect all ungrounded conductors
  - Lockable in the off position

PV *Equipment* Disconnection – 690.15

- Devices are required to isolate:
  - PV modules, Fuses, DC-DC converters, Inverters, Charge Controllers
  - Where maximum current is over 30 amps, the isolating device shall be an equipment disconnecting means
  - A single equipment disconnecting means shall be permitted for where charge controller or inverter has multiple input circuits
- Shall be installed (or remotely operated within) 10 feet and within sight of the equipment
- Equipment disconnecting means shall have interrupting rating sufficient for maximum Isc and Voc
  - *This is not required of isolating devices*
- Isolating devices are not required to simultaneously disconnect all current-carrying conductors
  - Rated to open max. circuit current under load, OR…
  - Marked "do not disconnect under load" or "not for current interrupting"
    - PV connector, Finger safe fuse holder, Isolating switch that requires a tool to open (turn off), or Isolating device listed for the intended application
- Equipment Disconnecting Means
  - Simultaneously disconnect all not solidly grounded current carrying conductors
  - Externally operable without exposing to live parts
  - Indicate whether in the open or closed position
  - Lockable
  - Shall be one of the following:
    - Manually operable switch or circuit breaker
    - Connector meeting requirements of 690.33(E)(1)
    - Load break fused switch
    - Remote controlled breaker that is operable locally and opens when power is interrupted
  - Where line and load can be energized in open position, be marked in accordance with 690.13 (B)

Electric Power Production Sources *Equipment* Disconnection – 705.21

- Means provided to disconnect power production equipment from all ungrounded conductors of all sources of supply. Equipment as integral part of >1000 system not required to have a disconnecting means

Rapid Shutdown – 960.12

- Is System Installed on a Building? RSD only required on buildings.
- <u>Verify RSD Functionality</u>
- Controlled Conductors <u>Outside</u> Array Boundary:
  - Over 1' outside of array or > 3' inside building – not more than 30 V in 30 seconds
- Controlled Conductors <u>Inside</u> Array Boundary:
  - PV array listed or field labeled as a rapid shutdown PV array. or…
  - Conductors within 1' of array or < 3' inside building – not more than 80 V in 30 seconds
- Initiation Device
  - 1 & 2 family dwellings, shall be located outside, readily accessible
  - Shall be one of the following, and not more than 6 switches
    - Service disconnecting means
    - PV system disconnecting means
    - Readily accessible switch that plainly indicates it is in the ON or OFF position
    - RSD equipment listed for RSD (excluding initiation devices)

Wiring Methods – 690.31

- PV Source and Output circuits operating at 30 volts or greater shall be guarded or not readily accessible
- PV Source and Output Circuits shall not be contained in same raceway, junction box or similar fitting as conductors of non-PV systems or inverter output circuits. Unless separated by a partition.
  - PV system conductors identified at all accessible points of termination, connection, and splices
    - Identified by separate color coding, marking tape, tagging, or other approved means
    - Not required where identification is evident by spacing or arrangement
  - Conductors of more than one PV system in same Junction box or raceway with a cover shall have AC and DC conductors grouped separately at least once and at least every 6'
    - Not required if circuit enters from a cable or raceway that makes the grouping obvious
- Single-Conductor USE-2 and type PV wire permitted in exposed outdoor locations within PV array
  - PV wire installed in accordance with 338.10(B)(4)(b) and 334.30
  - PV wire is generally dual rated as USE-2
  - Bending radius: inner edge of the bend not less than 5 times the diameter of the cable
    - #10 PV wire = ~1 3/8"
- DC PV circuits in a building contained in metal raceways, enclosures, or MC Cable (250.118(10)) from point of penetration to first readily accessible disconnecting means
  - Where embedded in roofing materials not covered by PV modules and equipment, shall be permanently and clearly marked
  - FMC smaller than ¾" or MC smaller than 1" shall be protected by substantial guard strips when run across ceilings or floor joists
    - Where run exposed, closely follow building surface or be protected from physical damage – up until 6' of their connection to equipment
- Flexible, fine-stranded cables shall be terminated only with connectors and terminals identified for the use. See 110.14

System Grounding - 690.41

- DC PV array has ground-fault protection
  - *Solidly grounded, not on or in buildings, and not more than 2 PV source circuits, permitted without GFP*
  - Listed for PV ground-fault protection and detects faults in PV DC conductors and components
  - Ground-fault Isolations means:
    - Automatically disconnects current carrying conductors of faulted equipment, or
    - Inverter or charge controller isolates faulted PV DC circuits, and ceases supplying power

Equipment Grounding and Bonding - 690.43

- Exposed non-current-carrying metal parts of PV systems shall be grounded. See 250.134 and 250.136(A)
- Devices used for PV module mounting and bonding shall be listed
- EGC for PV array is run with circuit conductors when they leave the vicinity of the array

Size of EGC - 690.45

- For PV output circuits sized in accordance with 250.122.
- EGC shall not be smaller than 14 AWG

Grounding Electrode System - 690.47

- Buildings or structures supporting a PV array has a grounding electrode system
- PV array EGC is connected to the structure grounding electrode system
  - EGC for the PV system output connected to the associated distribution equipment is permitted to be the connection to ground for equipment grounding and GFP. In "functional" grounded systems

Supply Side Connections – 705.12

- Connections are permitted on ***supply side*** of service disconnecting means
  - Sum of all OCPD connected to power production sources not to exceed rating of the service
  - OCPD connected to supply side of service disconnecting means located within 10' of the connection
    - *10' not required with use of cable limiters or current-limited breakers at point of connection to service*

Load Side Connections – 705.12

- Connections are permitted on ***load side*** of service disconnecting means
  - Each source interconnection of (one or more power sources) made at dedicated breaker or fusible disconnecting means
  - 125% of power source output circuit current (PSOCC) to be used for ampacity calculations
    - Feeders: Where connected at anywhere other than opposite end from the primary OCPD of a feeder, the load side portion of the feeder shall be protected by:
      - Feeder ampacity > Primary OCPD + 125% PSOCC, or
      - OCPD on load side of PSOCC rated not greater than feeder ampacity
    - Taps off feeders: sized as sum of 125% PSOCC + rating of OCPD protecting the feeder
    - Busbars in panelboards. Ratings determined by one of the following:
      1. 125% PSOCC + Main OCPD = does not exceed rating of busbar
      2. 125% PSOCC + Main OCPD = does not exceed 120% of busbar ampacity. These requirements shall apply:
         - Must contain loads
         - PSOCC and Main OCPD located at opposite ends of busbar
         - Busbar sized for loads in accordance with Article 220
         - Warning label applied: "Warning: Power Source Output Connection – Do Not Relocate This Overcurrent Device"
      3. Sum of ALL OCPD in Panelboard (both load and supply) does not exceed ampacity of busbar. Main OCPD does not exceed rating of busbar. Label applied: "Warning: This equipment fed by multiple sources. Total rating of all OCPD excluding main supply OCPD shall not exceed ampacity of busbar."
      4. Center-fed panelboard connection permitted at either but not both ends where: 125% PSOCC + Main OCPD = does not exceed 120% of busbar ampacity
      5. Connections permitted on multiple-ampacity busbars where designed under engineering supervision
  - Backfed circuit breakers shall be suitable for backfeed
  - Listed interactive electric power sources permitted to omit fastener required by 408.36(D)

Interrupting and Short-Circuit Current Rating - 705.16

- Consideration shall be given to the contribution of fault currents from all interconnected power sources for the interrupting and short-circuit current rating of equipment on interactive systems

Overcurrent Protection from all Sources - 705.30

- Sufficient number of OCPD provided to protect conductors from all sources
  - Solar PV Systems, Interactive Inverters, Transformers, Generators

Microgrid Interconnect Devices - 705.170

- Required for any connection between microgrid and primary power source
- Listed for the application
- Have sufficient number OCPD to provide protection from all sources

General Requirements

- Is the Equipment Listed for the PV Application? - 690.4
- All equipment approved for intended use and listed for interconnection - 705.4
- PV systems connected to other sources installed in accordance with Article 705

Maximum Voltage - 690.7

- 1-2 Family Dwellings, Max. Voltage 600 V
- Other Buildings, Max. Voltage 1,000 V
- Not on Buildings, Max. Voltage 1,500 V
- Temperature-Corrected Maximum Voltage Calculations:
  - Using manufacturers temp. coefficient, Table 690.7, or Engineering (over 100 kW system size)

Circuit Sizing and Current – 690.8

- Maximum PV Source Circuit Current
  - Parallel connected module Isc * 1.25, or Engineering (over 100 kW system size)
- Conductor Ampacity
  - Max. circuit current * 1.25
  - *or maximum current adjusted for correction factors
- Overcurrent Protection
  - Not required for circuits sized for the highest available current
  - Required for three or more parallel connected strings
    - Unless ISC from all sources doesn't exceed conductor and PV ocpd rating
- Overcurrent Device Ratings
    - If used in DC PV circuits shall be listed for use in PV systems
      - Max. circuit current * 1.25, or
      - Max. circuit current * 1.0 if listed for continuous duty, or
      - Adjustable electronic ocpd

- <u>Interactive Inverters Ampacity and OCPD Ratings</u>
  - Calculating maximum current
    - Inverter input current is maximum rated input current of inverter
    - Inverter output current is inverter continuous output current rating
  - Ampacity and OCPD ratings
    - Conductors and OCPD sized for not less than 125% of 705.60(A)
    - *Not required if the assembly (including OCPD) is rated for continuous operation at 100% of its rating*
- <u>Interactive Inverter Overcurrent Protection</u>
  - OCPD required to protect all circuits from all sources in accordance with Article 240
    - *Not required for circuit conductors sized in accordance with 705.60(B) and*
      - *No external parallel connected circuits, batteries, or inverter backfeed, or*
      - *ISC from all sources do not exceed the ampacity of the conductors*
  - Power Transformers require OCPD on both sides
    - *Not required if on the inverter side of the transformer if it has a current rating not less than the rated continuous output current of the inverter on the inverter side of the transformer*
  - Feeder Taps
    - Sized to carry not less than the larger of current calculated in 705.60 (B), or
    - As calculated in accordance with 240.21 (B)

Interactive inverters are permitted to be mounted in not readily accessible locations - 705.70. Requirements:

- DC Disconnect mounted within sight of inverter
- AC Disconnect mounted within sight of inverter
- Additional AC Disconnect complying with 705.22
- Plaque Installed in accordance with 705.10

Rapid Shutdown – 960.12

- Is System Installed on a Building? RSD only required on buildings.
- Controlled Conductors Outside Array Boundary:
  - Over 1' outside of array or > 3' inside building – not more than 30 V in 30 seconds
- Controlled Conductors Inside Array Boundary:
  - PV array listed or field labeled as a rapid shutdown PV array. or…
  - Conductors within 1' of array or < 3' inside building – not more than 80 V in 30 seconds
- Initiation Device
  - 1 & 2 family dwellings, shall be located outside, readily accessible
  - Shall not consist of more than 6 switches
  - Shall be one of the following
    - Service disconnecting means
    - PV system disconnecting means
    - Readily accessible switch that plainly indicates it is in the ON or OFF position
- Equipment
  - RSD equipment shall be listed for RSD (excluding initiation devices)

PV *System* Disconnecting Means – 690.13

- Means provided to disconnect PV system from all other wiring systems
  - Refer to definition and diagram of different "PV System Disconnecting Means" locations. This can change based on if the system is Utility Interactive, Multimode, or Stand-alone – 690.2
- Installed at readily accessible location
- If connected to supply side of service disconnecting means: shall be suitable for use as Service Equipment
- Sufficient for maximum circuit current, available fault current, and rated voltage
- Type
  - Simultaneous disconnection of PV system conductors from other wiring systems
  - ***DC*** PV system disconnect shall be marked for use in PV systems or suitable for backfeed
  - If marked "line" and "load" shall not be permitted for backfeed/reverse current
    - This applies to disconnecting means. Follow equipment listing. 110.3(B)
  - DC rated switches and low-voltage power circuit breakers are permitted for backfeed

Electric Power Production Sources Disconnection

- Means provided to disconnect all ungrounded conductors of an electric power production source from all other conductors – 705.20
- Readily accessible and able to disconnect interactive system from all wiring systems – 705.23

Electric Power Production Sources Disconnect Device for Ungrounded Conductors – 705.22

- A manual or power operated switch or breaker that:
  - Readily accessible
  - Externally operable without exposing operator to live parts. If power operated, can be opened by hand in case of a power failure
  - Plainly indicate whether it is off or on
  - Rated for maximum current, available short-circuit current, and voltage at terminals
  - If line and load could be energized in open position, labeled in accordance with 690.13(B)
  - Simultaneously disconnect all ungrounded conductors
  - Lockable in the off position

Electric Power Production Sources *Equipment* Disconnection – 705.21

- Means provided to disconnect power production equipment from all ungrounded conductors of all sources of supply. Equipment as integral part of >1000 system not required to have a disconnecting means

PV *Equipment* Disconnection – 690.15

- Devices are required to isolate:
  - PV modules, Fuses, DC-DC converters, Inverters, Charge Controllers
  - Where maximum current is over 30 amps, the isolating device shall be an equipment disconnecting means
  - A single equipment disconnecting means shall be permitted for where charge controller or inverter has multiple input circuits
- Shall be installed (or remotely operated within) 10 feet and within sight of the equipment
- Equipment disconnecting means shall have interrupting rating sufficient for maximum Isc and Voc
  - *This is not required of isolating devices*
- Isolating devices are not required to simultaneously disconnect all current-carrying conductors
  - Rated to open max. circuit current under load, OR…
  - Marked "do not disconnect under load" or "not for current interrupting"
    - PV connector, Finger safe fuse holder, Isolating switch that requires a tool to open (turn off), or Isolating device listed for the intended application
- Equipment Disconnecting Means
  - Simultaneously disconnect all not solidly grounded current carrying conductors
  - Externally operable without exposing to live parts
  - Indicate whether in the open or closed position
  - Lockable
  - Shall be:
    - Manually operable switch or circuit breaker
    - Connector meeting requirements of 690.33(E)(1)
    - Load break fused switch
    - Remote controlled breaker that is operable locally and opens when power is interrupted
  - Where line and load can be energized in open position, be marked in accordance with 690.13 (B)

System Grounding - 690.41

- DC PV array has ground-fault protection
  - *Solidly grounded, not on or in buildings, and not more than 2 PV source circuits, permitted without GFP*
  - Listed for PV ground-fault protection and detects faults in PV DC conductors and components
  - Ground-fault Isolations means:
    - Automatically disconnects current carrying conductors of faulted equipment, or
    - Inverter or charge controller isolates faulted PV DC circuits, and ceases supplying power

Equipment Grounding and Bonding - 690.43

- Devices used for PV module mounting and bonding shall be listed

Size of EGC - 690.45

- For PV output circuits sized in accordance with 250.122.
- Increases in EGC size to address voltage drop shall not be required
- EGC shall not be smaller than 14 AWG

Grounding Electrode System - 690.47

- Buildings or structures supporting a PV array shall have a grounding electrode system
- PV array EGCs shall be connected to the structure grounding electrode system
  - EGC for the PV system output connected to the associated distribution equipment is permitted to be the connection to ground for equipment grounding and GFP. In "functional" grounded systems
  - In "solidly" grounded systems, GEC is required connecting the grounded conductor and the grounding electrode system
- Additional Auxiliary Electrodes for Array Grounding are permitted

Ampacity of Neutral Conductor from Interactive Inverter

- When used solely for instrumentation, voltage detection, or phase detection, can be sized to equal to or larger than EGC

Wiring Methods – 690.31

- PV Source and Output circuits operating at 30 volts or greater shall be guarded or not readily accessible
- Single-Conductor USE-2 and type PV wire permitted in exposed outdoor locations within PV array
  - PV wire installed in accordance with 338.10(B)(4)(b) and 334.30
  - PV wire is generally dual rated as USE-2
- PV output circuits using type PV wire permitted in cable tray. Supported every 12" secured every 4.5'
- Tracking PV arrays with flexible cords and cables connected to moving parts
- DC PV circuits in a building contained in metal raceways, enclosures, or MC Cable (250.118(10)) from point of penetration to first readily accessible disconnecting means

Arc-Fault Protection (DC) – 690.11

- Is there Listed Arc-Fault Protection for System operating over 80 VDC?
  - Not required for PV systems not installed on or in buildings

Supply Side Connections – 705.12

- Connections are permitted on ***supply side*** of service disconnecting means
  - Sum of all OCPD connected to power production sources not to exceed rating of the service
  - OCPD connected to supply side of service disconnecting means located within 10' of the connection
    - *10' not required with use of cable limiters or current-limited breakers at point of connection to service*

Load Side Connections – 705.12

- Connections are permitted on ***load side*** of service disconnecting means
  - Each source interconnection of (one or more power sources) made at dedicated breaker or fusible disconnecting means
  - 125% of power source output circuit current (PSOCC) to be used for ampacity calculations
    - Feeders: Where connected at anywhere other than opposite end from the primary OCPD of a feeder, the load side portion of the feeder shall be protected by:
      - Feeder ampacity > Primary OCPD + 125% PSOCC, or
      - OCPD on load side of PSOCC rated not greater than feeder ampacity
    - Taps off feeders: sized as sum of 125% PSOCC + rating of OCPD protecting the feeder
    - Busbars in panelboards. Ratings determined by one of the following:
      1. 125% PSOCC + Main OCPD = does not exceed rating of busbar
      2. 125% PSOCC + Main OCPD = does not exceed 120% of busbar ampacity. These requirements shall apply:
         - Must contain loads
         - PSOCC and Main OCPD located at opposite ends of busbar
         - Busbar sized for loads in accordance with Article 220
         - Warning label applied: "Warning: Power Source Output Connection – Do Not Relocate This Overcurrent Device"
      3. Sum of ALL OCPD in Panelboard (both load and supply) does not exceed ampacity of busbar. Main OCPD does not exceed rating of busbar. Label applied: "Warning: This equipment fed by multiple sources. Total rating of all OCPD excluding main supply OCPD shall not exceed ampacity of busbar."
      4. Center-fed panelboard connection permitted at either but not both ends where: 125% PSOCC + Main OCPD = does not exceed 120% of busbar ampacity
      5. Connections permitted on multiple-ampacity busbars where designed under engineering supervision
  - Backfed circuit breakers shall be suitable for backfeed
  - Listed interactive electric power sources permitted to omit fastener required by 408.36(D)

Interrupting and Short-Circuit Current Rating - 705.16

- Consideration shall be given to the contribution of fault currents from all interconnected power sources for the interrupting and short-circuit current rating of equipment on interactive systems

Overcurrent Protection from all Sources - 705.30

- Sufficient number of OCPD provided to protect conductors from all sources
  - Solar PV Systems – Article 690
  - Transformers – Article 450.3
  - Fuel Cell Systems - Article 692
  - Interactive Inverters – Article 705.665
  - Generators – Article 705.30

Microgrid Interconnect Devices - 705.170

- Required for any connection between microgrid and primary power source (Microgrid necessitates some energy storage technology)
- Listed for the application
- Have sufficient number OCPD to provide protection from all sources

At the Array

- At junction boxes, system and equipment disconnects
  Warning
  Electric Shock Hazard
  Terminals on Line and Load Side May Be
  Energized in the Open Position
  ****only where applicable****

- Raceways containing DC conductors
  Warning: Photovoltaic Power Source
  Every section of the wiring system that is separated by walls, partitions, etc
  Every 10'
  White letters (3/8" height minimum) on red background
  Reflective

- Covers of Junction/Pull boxes and condulets with unused openings containing DC conductors
  Warning: Photovoltaic Power Source

- DC PV system disconnect - for the DC PV power source
  PV System Disconnect
  Maximum voltage
  Maximum circuit current
  Maximum rated output current of charge controller or dc-dc converter *where applicable

- DC PV equipment disconnect - for the DC PV power source
  PV System Disconnect
  Maximum voltage
  Maximum circuit current
  Maximum rated output current of charge controller or dc-dc converter *where applicable

- DC PV system Conductors
  - PV system conductors identified at all accessible points of termination, connection, and splices
  - Identified by separate color coding, marking tape, tagging, or other approved means
    ***Not required where identification is evident by spacing or arrangement
  - Labels suitable for the environment where they are installed

At the Inverter

Warning
Electric Shock Hazard
Terminals on Line and Load Side May Be
Energized in the Open Position
****only where applicable****

Turn off AC disconnect prior to working inside panel

Inverter #

Interconnection Point

- Backfed circuits
  - Busbars or conductors fed from multiple sources marked to indicate the presence of all sources
    Warning: Dual Power Source
    Or
    Caution: PV System Circuit is Backfed

  - Circuit breakers back-feeding a busbar sized via 705.12(B)(2)(3)(b) – (the 120% rule)
    Warning
    Power Source Output Connection
    Do Not Relocate This Overcurrent Device

  - Where the sum of all OCPD (excluding the main) do not exceed ampacity of the busbar via 705.12(B)(2)(3)(c)
    Warning
    This Equipment Fed by Multiple Sources
    Total Rating of all Overcurrent Devices
    Excluding Main Supply Overcurrent Device
    Shall Not Exceed Ampacity of Busbar

  - Panelboard
    This Panel Fed from Inverter #

    Warning: Arc Flash and Shock Hazard
    Appropriate PPE Required
    *****arc flash calculations*****

    Turn off AC disconnect prior to working inside panel

- Interactive system point of interconnection with other sources
  Photovoltaic AC Disconnect
  AC output current
  Nominal operating voltage

- System Disconnect
  (MAIN) PV System Disconnect

  - Facilities with Utility Services and PV:
    Permanent plaque or directory denoting location of all electric power source disconnecting means. Installed at each service equipment location and the location(s) of the interconnected system disconnecting means
    *** Includes interactive inverters not mounted in readily accessible locations

- Service
  Maximum Available Fault Current:
  Date Calculated:

- Rapid shutdown switch
  Solar PV System Is Equipped With Rapid Shutdown
  RSD Type – Yellow (2017) or Red (2014)
  Plainly indicates whether ON or OFF
  Readily accessible
  Labeled within 3' of service disconnecting means
  Labeled within 3' of rapid shutdown switch
  Must be outside for 1&2 family dwellings
  More than One RS Type requires a detailed plan view diagram of each system type and a dotted line around areas that will remain energized after activation

- Facilities with Stand-Alone Systems have permanent plaque or directory at the exterior and a readily accessible location. Indicate presence of stand-alone electrical power system and location of disconnecting means