



The Electrical Safety Leader

NEC®-2023

ANALYSIS OF CHANGES



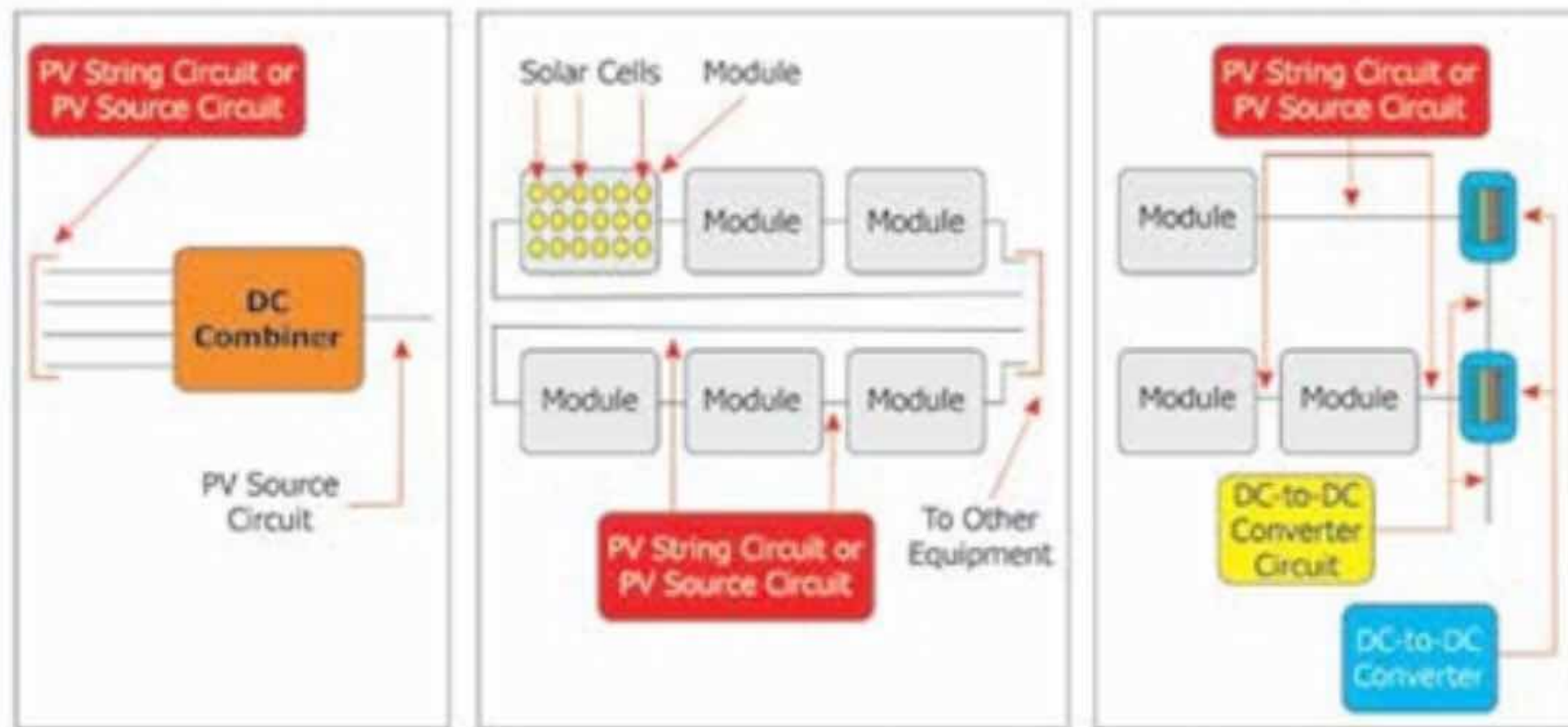
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690.1 Figure Informational Note

New simplified illustrations using new and revised definitions were added identifying typical photovoltaic (PV) system dc components and conductors



Drawings based on Figure 690.1 found in the 2023 NEC

690.4(G)

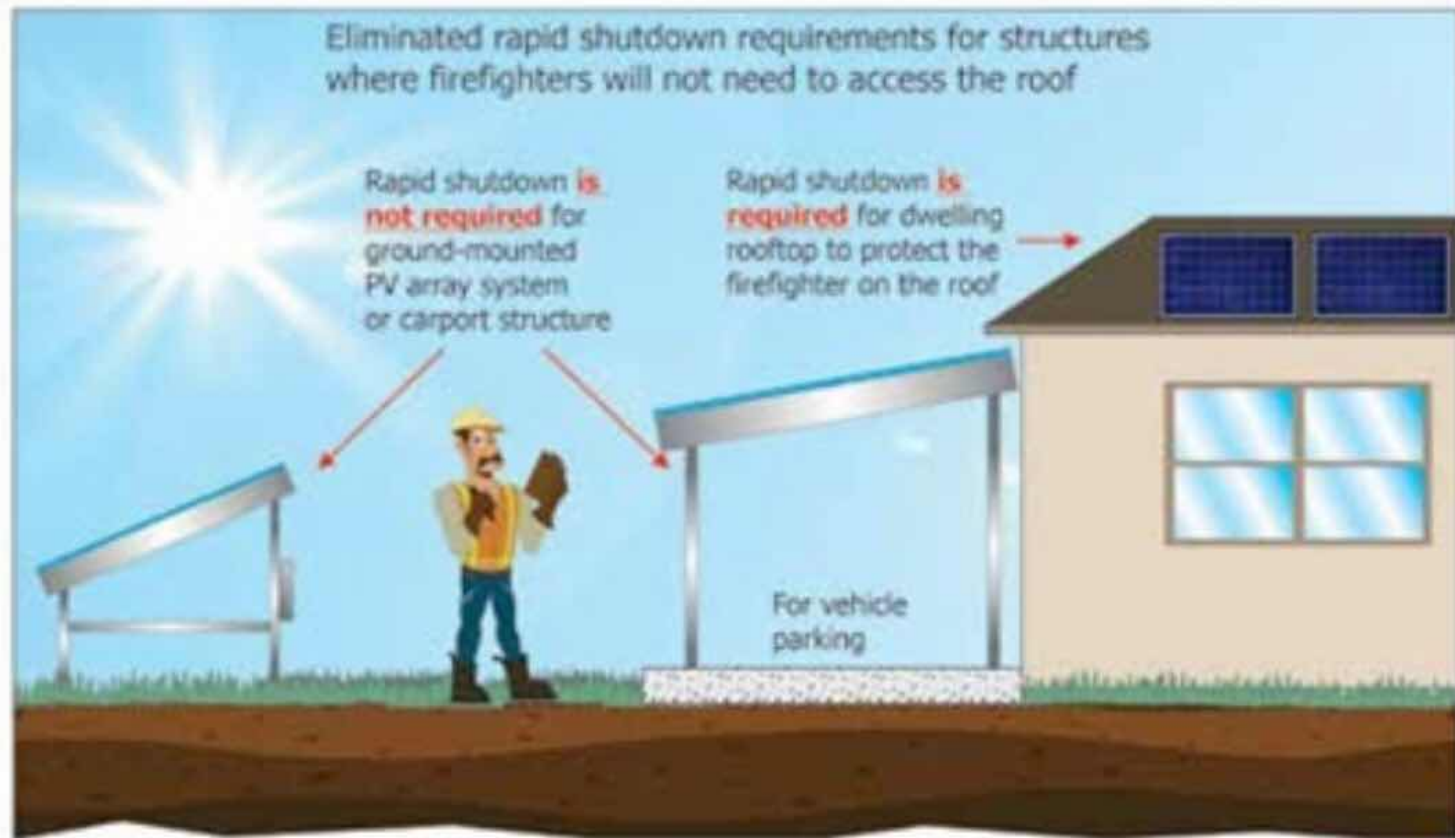
PV EQUIPMENT FLOATING ON BODIES OF WATER



690.4(G) PV Equipment Floating on Bodies of Water

Type of change: New

690.12 Exception No.2 and Informational Note



690.12 Exception No. 2 & Informational Note

Type of change: Revision

690.12(B)(2) Inside the Array Boundary

Two options were revised for rapid shutdown compliance inside the PV array

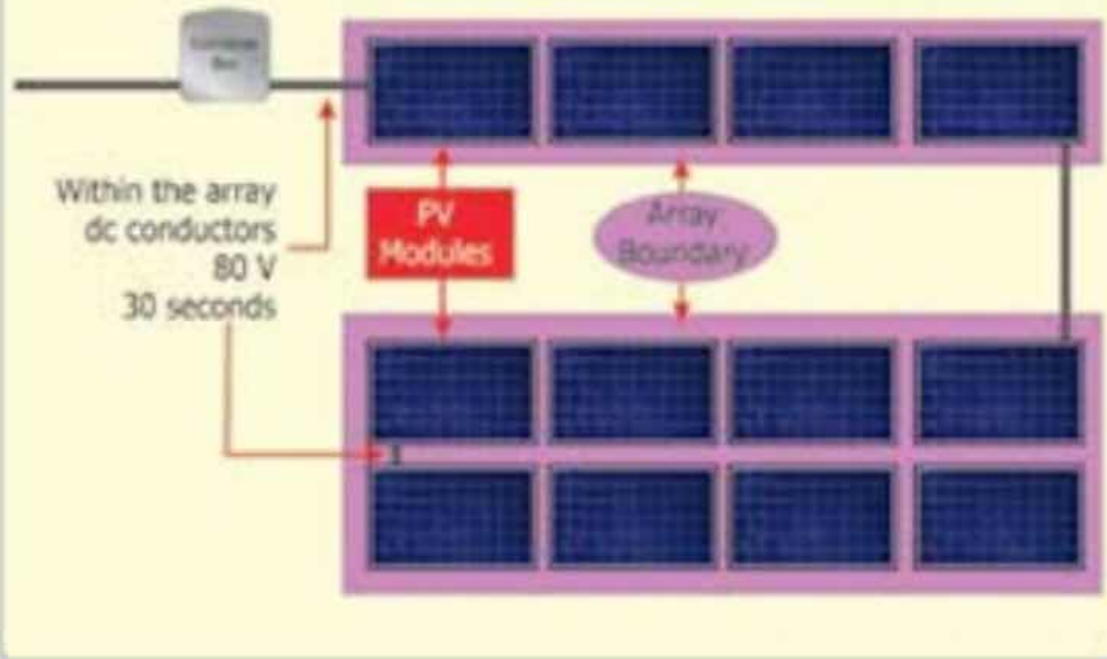
1st option

- PV shock hazard control
- **listed and labeled** per installation instructions



2nd Option

Reduce shock hazards to a maximum of **80 volts dc** within the array boundary and inside the PV equipment within **30 seconds**



690.12(B)(2) Inside the Array Boundary

Type of change: Revision



Photo courtesy of Jim Rogers

690.15 Disconnecting Means for Isolating Photovoltaic Equipment

Type of change: Revision

690.31(B) Identification and Grouping- Different Systems

Provides conditions where PV DC circuits and inverter output circuits can now be installed in the same junction box, pull box or wireway



Photo courtesy of Pete Jackson

Energizer Earl says:

Must be **identified, grouped and separated** in accordance with 690.31(B)(2) and (B)(3)

Change was made to **provide relief** where inverters are installed in conjunction with a wireway or box

- Where the inverter has 2 raceways extending from the inverter to the wireway or box
- When the AC and DC conductors can be **sufficiently grouped, supported, and separated from each other**



690.31(B) Identification and Grouping.
(1) Conductors of Different Systems.
Exception List Item (2)

Type of change: Revision



Photo courtesy of Pete Jackson

690.31(B)(1) Conductors of Different Systems. – Exception

Type of change: Revision

705.11

Source Connections to a Service



705.11 Source Connections to a Service

Type of change: Revision

705.13 Energy Management Systems (EMS)

Interconnected Electric Power Production Sources

Components of a listed
energy management
system my company installs

Photo courtesy of Eaton



705.13 Energy Management Systems

705.20

SOURCE *DISCONNECTING MEANS*



705.20 Source Disconnecting Means

Type of change: Deletion

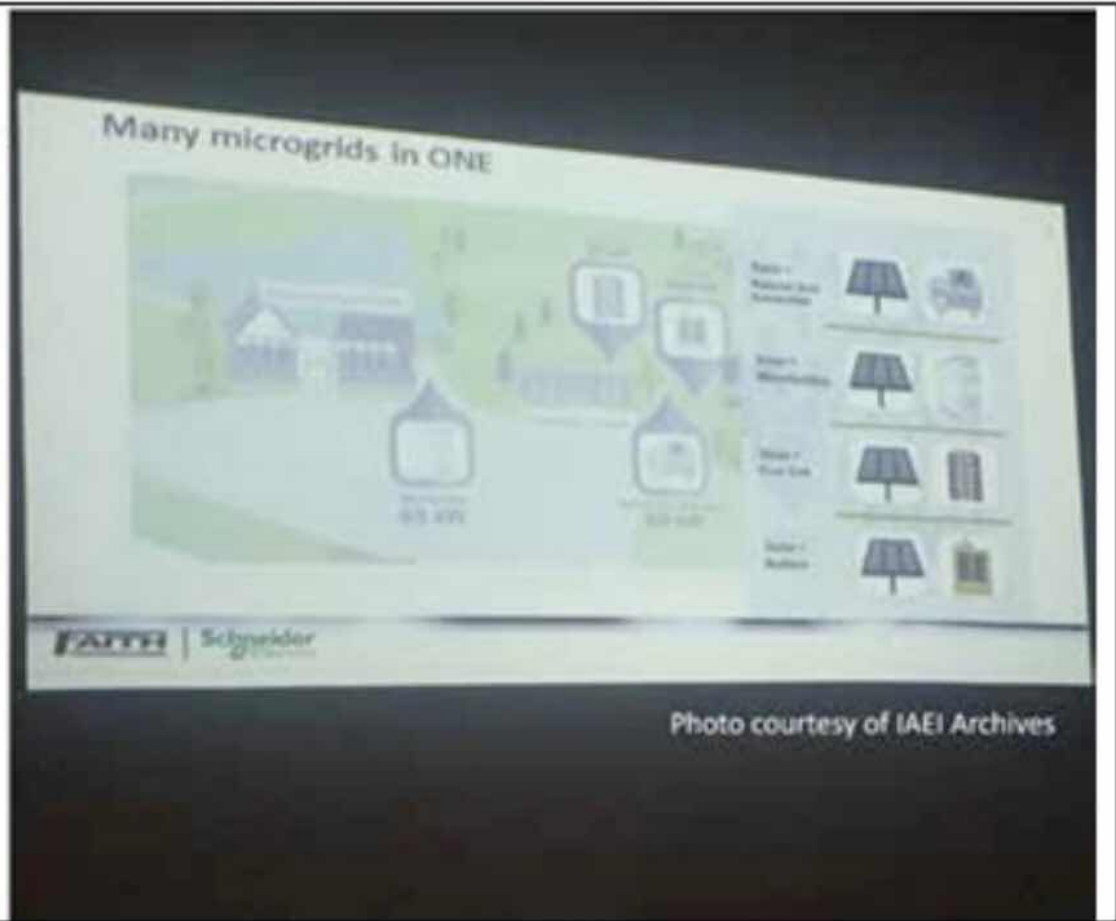
705.50

SYSTEM OPERATION

A Faith Technologies and Schneider Electric renewable energies project in Wisconsin

Microgrid consisting of:

- Solar (PV)
- Natural gas generator
- Microturbine
- Fuel Cells
- Batteries



705.50 System Operation

Type of change: Revision