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## **SOLAR PHOTOVOLTAIC POWER SYSTEMS**

Solar photovoltaic power systems are becoming more commonplace. The ability to convert light energy into electricity offers a cost savings to the consumer, takes advantage of a renewable resource and reduces

the strain on utility power systems. These systems generate electricity that is a potential ignition source, and when installed on buildings these systems can also cause difficulty for fire-fighting operations.

These systems will generate electricity when exposed to sunlight, and the only disconnect is after the electric current is generated. For this reason, conduits and raceways need to be marked and located near the roof ridges or valleys or beneath structural roof members. Locating beneath the roof structural members reduces the potential for a roof ventilation operation to unintentionally cut through the conduit. [Ref. 605.11.1, 605.11.2]

The NEC requires that the disconnect means is in a readily accessible location. NEC Section 690.31 requires the disconnect means to be marked (Figure 6-14). If the disconnect is not at the main electrical disconnect for the building, it must be visible from the point where the main service disconnect is operated. [Ref. 605.11]

The IFC contains requirements for solar photovoltaic systems on commercial and industrial buildings, ground-mounted systems and systems on Group R-3 occupancies not constructed under the IRC. The IRC contains requirements for solar photovoltaic systems on dwellings constructed under that code (Figure 6-15).

The solar panel array area is limited in size to 22,500 square feet with a maximum dimension of 150 feet. Additionally, the solar panels must be spaced to provide fire-fighter walkways of 3 feet in width for residential buildings and 6 feet in width for commercial buildings. Spacing from roof ridges is required to provide areas for openings in the roof to be cut for fire-fighting operations (Figure 6-16).



**FIGURE 6-14** Solar photovoltaic disconnect switches



**FIGURE 6-15** Solar panels on a one-family dwelling



**FIGURE 6-16** Solar panels on a commercial building