

EXECUTIVE SUMMARY

Although PV systems provide many benefits to the environment, there are hazards associated with them being installed onto rooftops. The installation of PV systems on roofs creates electrical, fire, structural, and weather-related hazards that are not adequately addressed by current codes, standards and guidance documents. Significant progress has been made in the past years (as will be identified in this report), but there are still gaps that need to be addressed.

The purpose of this literature review is to compile information on a wide variety of hazards and damage potential created by the installation of photovoltaic (PV) systems on commercial roof structures.

The report reviews recent major PV fire incidents including those at Bakersfield, CA, and Mount Holly, NC, Goch, Germany, DeLanco, NJ and LaFarge, WI and concludes that much can be learned from these and other non-fire related failure incidents, most of which are not documented in the public literature.

The report then summarizes basic performance categories associated with PV panel installation practice and identifies key installation features impacting this performance. These include performance under structural loading, wind loads, hail, snow, debris accumulation, seismic loads, and fire hazards including flammability of components, ignition hazards and electrical hazards associated with fire fighter operations.

The report reviews existing information in the literature related to best practices for installation to address the performance issues described above. A comprehensive reference section is provided.

Finally, an assessment of key gaps in available information and understanding of performance is presented, highlighting areas of additional needed work. These include:

- Longterm performance of PV modules
- Design for wind in the presence of deflectors and shrouds
- Longterm performance with respect to hail damage
- Design for accumulated snow load