

Risk A/T[®] Work

"An ounce of prevention is worth a pound of cure." Benjamin Franklin 1736

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Managing the Hazards of Roof Mounted Photovoltaic Panels

Dave Isherwood MEng, CEng, MIMechE, Senior Property Risk Specialist, Sompo Global Risk Solutions, <u>disherwood@sompo-intl.com</u>

Sustainable power is high on many agendas, and one seemingly simple way to add to the mix, is to install photovoltaic (PV) panels on used roof space. As with any changes to buildings, careful consideration is needed to ensure any new hazards are mitigated.

There is potential for rooftop mounted PV panels to be a source for fires, spreading to the building on which they are installed, causing large scale damage and business interruption. The presence of rooftop PV panels can hamper fire-fighting efforts as manual venting of fires may not be possible, elevated hose streams could be obstructed, and there may be reluctance to apply water to the fire for fear of electrocution.

In this edition of Risk A/T Work, we provide some key measures for building owners and occupiers to mitigate potential hazards of roof mounted PV panels.

Physical Arrangement:

Careful consideration should be given to the physical arrangement of roof mounted PV panels to ensure they do not create excessive loads, nor create potential ignition sources near to combustible building elements.

Loading:

The presence of PV panels on building roofs can represent a significant increase in weight loading. The weight of the panels themselves, potential snow drifting against the panels, and increased wind forces can all lead to loading which may damage the building. To prevent this from occurring, a qualified structural engineer should review the additional loads to ensure that building codes have not been compromised and that the structure is strong enough to bear the weight.

Combustible Roofs and PV Panel Placement:

PV panels should not be installed on combustible roofs or roofs with combustible insulation. If this is unavoidable, replace or cover any combustible layer directly beneath and around the panels with non-combustible materials, extending 2-m (6-ft) beyond the outer edge of the panels.

Ensure the arrangement of any components such as cables, fixings, etc., do not breach compartmentation or fire walls and parapets, either going through or over. If unavoidable, they should be installed in fire resistant cable ducts and shafts. Cable penetrations into the building should be housed within a non-combustible sleeve, fitted to the full thickness of the wall/roof with non-combustible packing around the cable within the sleeve.

The PV panels should be fully secured to the rooftop, ensuring the fixing does not compromise the waterproof membrane or insulation. Ballasts or any weighting down methods without fixings should not be used.

Provide walkways between panels to allow access for maintenance and never install PV panels over drains.

Inverters should be located at ground level in fire rated enclosures (minimum 1-hr), kept clear of combustibles and provided with fire detection. Isolation switches should be located in readily accessible and clearly signed areas to allow safe access by fire and rescue services, etc.





Ensure all servicing and maintenance is completed in accordance with the manufacturer's instructions and by competent, qualified engineers.

Management and Maintenance:

PV panels are not a "fit and forget" system. Operators and building occupants need to take the panels' presence into account in their procedures. However, the procedures do not need to be overly complex to reduce the risk the panels may pose.

Emergency Response:

Ensure the premises' Fire, and Health & Safety risk assessments are reviewed and updated regularly, to take into consideration the PV solar panel system.

Any emergency response plan should also take the presence of the PV panels into account, including isolating the panels on discovery of a fire. The location of panels and energy isolation switches should be clearly identified as well as being clearly marked on building layouts kept in emergency packs.

PV installations should be provided with remote load monitoring and alarms. The alarms should signal to a permanently manned station or to a cascade of contact phone numbers where site staff have the option to remotely check the plant condition.

Shading and Cleaning:

Partial shading can lead to hot spots causing the panel to deteriorate, resulting in faults that cause fires. Panel placement should take into account shading and periodic inspection. The pruning of nearby vegetation should be included as part of the planned maintenance routine in addition to cleaning panels with water and suitable detergent to remove dust, bird droppings, etc. Frequency of cleaning will depend on local conditions but should be formally recorded.

Electrical Maintenance:

Ensure all servicing and maintenance is completed in accordance with the manufacturer's instructions and by competent, qualified engineers. Also include a thermographic inspection of the entire system, whilst under load, on an annual basis or twice per year for combustible roofs. Detailed maintenance records should be made available to building occupants.

For more information on rooftop mounted PV panel safety, please reach out to your Sompo GRS Risk Control Specialist or contact us at 1 877 667 5733 or <u>GRSRiskControlQuestions@</u> <u>sompo-intl.com</u>.