Riding the Green Wave

How to Ensure Firefighters' Safety in New Buildings

Dan Kittay

With fuel costs and concerns about climate change rising, there has been more attention focused on "green buildings," which can help cut electricity costs and reduce carbon emissions. And while most people agree this approach is good for the country, the trend toward green is not a black-and-white issue for the fire service. With green buildings come new approaches to building design, and in some cases new materials and structures built into and on top of buildings, which many firefighters will not have seen before. Some can pose dangers if not handled properly.

"Green buildings require smarter firefighters," says Curt Varone, director of public fire protection for the NFPA. "Firefighters have to be proactive in getting out and inspecting buildings, becoming familiar with buildings, and developing effective and safe tactics to go along with how to operate in these buildings." Varone and others involved in the firefighting profession say that while some localities around the country are in various stages of planning how to balance building green with ensuring that firefighters can safely handle emergencies, they have seen no large scale conversation between fire services and those who plan, construct, and regulate green buildings. "In many areas, firefighters are in a reactive mode. They go to a fire and then react to it, and afterward take some lessons learned and adjust the way they operate. There are some progressive fire departments out there actively looking for problems before they happen, and those are the ones that are most likely to identify the green building issues and prevent a tragedy from happening," Varone says.

One of the more visible issues with green building is the use of photovoltaic (PV) arrays, commonly called solar panels. They are increasingly being installed on the roofs of commercial and residential buildings. Retail chains such as Kohl's and Wal-Mart have programs in place to use their stores' roofs for large PV arrays to reduce electricity costs.

With roofs sometimes being a key strategic position for firefighters, the presence of PV arrays raises some questions. "How do you handle limits on where you can ventilate, and how easy is it to remove a panel if you need to? Are there structural integrity issues with cutting a hole next to a panel?" says Jim Milke, professor and associate chair of the Department of Fire Protection Engineering at the University of Maryland.

With a number of buildings installing PV systems, the Alameda Fire Department in California considered those and other questions when it developed a standard on such systems, says Fire Marshal Michael Fisher. "Electrical hazards and access to the roofs for

"There are some progressive fire departments out there actively looking for problems before they happen, and those are the ones that are most likely to identify the green building issues and prevent a tragedy from happening."

ventilation" were the primary concerns, Fisher says. The standard requires there be 36 inches of walking space around PV arrays, as well as between each panel, Fisher says. That would allow enough room for firefighters to be able to ventilate as needed. Electrical concerns are handled by requiring electrical disconnect switches that firefighters can access, he says. While there can be residual electricity stored in an array at night, it is low amperage and should not pose any risk to firefighters who might need to cut through a power line, although sparks could be produced, he says.

The department's standard, which is based on a proposed statewide standard, also requires signs on electric panels and near PV arrays notifying firefighters there are PV arrays in use.

Being aware of firefighters' concerns is a learning process for those in the solar power industry as well. "I didn't understand the need to provide for venting," says Josh Haney, senior project manager for Borrego Solar, a solar panel installation company. The San Diego-based firm installed some PV arrays on fire houses in the city as a thank you for the department's work in battling wild fires in the area, Haney says. Through the project, Borrego learned about such techniques as installing self-venting skylights as a way to reduce the need to cut near the arrays. The increased use of PV systems means firefighters should learn about the risks involved in working with them, Haney says. "Firefighters should have a good respect for a solar system, because it is a power source on a roof. They shouldn't fear it, but there's a need for more understanding."

That sentiment is echoed in other parts of the firefighting profession about green building issues in general. For example, some forms of building insulation may be have a high R rating, but be less efficient in preventing flame spread, says Steve Greger, director of risk services and solutions for Fireman's Fund Insurance Co. In such cases, a balance must be drawn between being green and providing for safety, Greger says. "What are the risks to the fire service, both from the ability to fight a fire and the safety of the firefighters themselves?"

Some green building design calls for greater use of glass to allow more natural light in for heat and light. With increased glass also comes a risk that shattering glass could pose a threat to firefighter safety, Greger notes. Finding the right balance between green and firefighting concerns will come from increased discussions between all involved in the question, he says.

All people interviewed for this article agreed that more discussion is needed. "It's just a matter of time before every community in the country experiences a fire in a green building," says NFPA's Varone. "Green building is the wave of the future, and we need to be prepared for it." ●

ABOUT THE AUTHOR:

Dan Kittay is a firefighter in the Clifton Park Fire Department. He is a freelance writer and Web developer. He can be reached at dan@kittaynewmedia.com.