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June 12, 2013

To: State Building Code Council (SBCC) Building/Fire/Plumbing Standing Committee

From: Jeff Randall, Power Trip Energy and Solar PV TAG Member

Re: Recommendation of Solar PV TAG

I am sorry that I will be unable to attend the June 12 meeting of the Building/Fire/Plumbing standing committee due to a prior commitment. I do plan to participate in the meeting by phone but would also like to provide you the following written comments.

It is important to note that the recommendation of the Solar PV TAG was by consensus, with only one exception which was passed by a majority vote. Our TAG met 6 times and had effective participation of solar, building, and fire professionals at all the meetings. While the discussions were sometimes a bit tense, both sides (fire and solar) had a good mutual understanding of the others' concerns. The process was very positive and I believe we developed a good product.

The changes recommended by the Solar TAG to IFC Chapter 605.11 significantly improve the code. The TAG recommendation provides fire code officials with needed flexibility in their review of solar proposals. Homeowners with small roofs are allowed to effectively use their roofs to generate clean, renewable electricity. And the solar industry in Washington State will continue to be able to plan and install roof-top solar PV systems while ensuring safe access to fire professionals in the case of a fire.

Among the consensus agreements were the following:

- Include a reference to the use of "alternative materials and methods"
- Clarify the definition of Group U structures
- Make marking provisions consistent with the NEC (National Electric Code)
- Improve DC conductor location requirements
- Cleaned up inconsistent language regarding "code official"
- Added needed exceptions to ventilation and access provisions for situations where: a) fire sprinklers present, b) passive or active ventilation provisions present, c) the code official determines the roof is too steep fire access, d) the code official determines roof ventilation techniques would not be utilized.
- 3 ft. peak ventilation setback reduced to 18" for ladder placement on back side of roof.
- 10 ft. vegetation setback for ground mount arrays eliminated.

The one provision in the TAG recommendation that was not reached by full consensus is exception #5 to section 605.11.3.2 which states:

605.11.3.2 Residential systems for one- and two-family dwellings. Access to residential systems for one- and two-family dwellings shall be provided in accordance with Sections 605.11.3.2.1 through 605.11.3.2.4.

Exceptions:

- 1. Residential dwellings with an approved automatic fire sprinkler system installed.
- 2. Residential dwellings with approved mechanical or passive ventilation systems.

3. Where the fire code official determines that the slope of the roof is too steep for emergency access.

4. Where the fire code official determines that vertical ventilation tactics will not be utilized.

5. Buildings under 10,000 s.f. in size where the solar array will cover less than 40% of the roof area over any floor. (emphasis added)

This provision passed by a 4 - 1 vote with two abstentions at our last meeting This provision is very important to the solar industry as it relates to residential roof-top solar PV installations. Per Phil Lou of the Washington State University Energy program, as of March 2013 there were 3,482 grid intertied solar PV systems in Washington State. Nearly all of these systems are located on residential roof-tops.

IFC Chapter 605.11 requires roof access and ventilation setbacks on all roof surfaces of residential, habitable buildings. On small roofs and roofs with multiple planes, these setbacks can significantly reduce the size of a PV array or even prohibit a PV array altogether. During the TAG process the solar industry repeatedly asked the question of why such setbacks were necessary on all roof surfaces if most of a building's roof area would not be covered by solar modules (usually only the south roof is utilized for solar modules). Wouldn't those other roof surfaces be available for fire fighter access?

When the TAG evaluated photos of buildings with 40% or less of the roof covered by solar modules, invariably the answer from the fire professionals was "yes," that fire personnel would be able to access that roof and ventilate if necessary. The changes to 605.11 recommended by the TAG would allow these types of solar PV installations where 605.11 as published by the ICC would not (or would require significant reduction in solar PV system size).

Thompson residence Port Townsend – solar modules on south roof only -25% of roof area covered.



Becker residence – Port Townsend – solar modules on south and west roofs only less than 20% of roof area covered.



Bruns residence – Port Townsend – south side only solar modules – 40% of roof covered. North side accessible.



These are just of few of the many real world examples the TAG considered.

The major problem with IFC section 605.11 as published by the ICC is that real world examples of solar homes do not appear to have been considered. Instead these diagrams below were used to illustrate how the setback provisions would apply. Note the lack of windows, chimneys, skylights, dormers, and small roof planes commonly found on northwest roofs. These code diagrams are unrealistic and hide the negative impacts of the code as written.



The 40% exception was drafted to make it easier for most solar projects to comply with 605.11 while ensuring adequate fire fighter access for those jurisdictions that will ventilate a building during a fire. The exception as written could be modified as needed to address the other 60% of the roof area being accessible from the ground.

Thank you for considering my comments and the recommendations of the Solar TAG.

Sincerely,

ff Bondall

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