Oregon
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November 10, 2009

Oregon Solar Energy Code Committee
October 8, 2009
Meeting Summary

****NOTE:** ***The following is a* summary *of the committee's discussion. To review the meeting in its entirety, the archived video of the meeting is available on the committee's Web site at the following link:*** http://www.bcd.oregon.gov/committees/10sec.html

Members Present:
Doug Aljets**,** Electrical and Elevator Board **and** Solar Installer for NW Current Energy, LLC
Brian Crise, International Brotherhood of Electrical Workers (IBEW), Local 48
Robin Rabiroff, Oregon Solar Energy Industries Association (OSEIA) **and** EC Company
Robert Rice, Oregon Building Officials Association (OBOA) **and** Josephine County Building, Official
Marcus Reed, State Fire Marshal
Jaimes Valdez, City of Portland – BPS/BDS
Ryan Mayfield, Renewable Energy Associates (for Dave Mumford)

Members Absent:
Nathan Philips, National Electrical Contractors Association (NECA)
Jerry Henderson, Independent Contractor for Department Of Energy (DOE) **and** Energy Trust of Oregon (ETO)
Robert Lane, Three Phase Electric
Dave Mumford, Lear Electric
Len Ralston, Solar Installer for Dynalectric

Guests Present:
Greg Creal, Central Electrical Training Center
Tom Baumann, International Brotherhood of Electrical Workers Local 280
Dale Landis, City of Lake Oswego
Dan Petrin, Frahler Electric
Joe Esmonde, International Brotherhood of Electrical Workers Local 48

Staff Present:
Chris Huntington, Policy and Technical Services Manager
Dennis Clements, Electrical Program Chief
Areon Teverbaugh, Policy Analyst
Jim Denno, Policy Analyst
Gabrielle Schiffer**,** Sustainability Coordinator
John Powell, Facilitator
Shauna Parker, Rules Coordinator
Dana Fischer, Building Code Para-Technical

Chris Huntington, Policy and Technical Services Manager welcomed the committee. He took a few moments to review with the committee activities that have been in progress since the last meeting on September 24, 2009. He explained that a solar "sub-committee" was developed which includes several members of the current committee and shared what tasks they were asked to work on.

Manager Huntington further explained that although the division's intent is to create a stand-alone code, there has been industry push back. He explained that the division is taking a closer look at the issues surrounding a stand-alone code and that development of one may not happen at this time. He asked that the committee come back to the next meeting ready to provide discussion on the pros and cons of having a stand-alone code.

John Powell asked Manager Huntington to discuss other agencies and requirements that could impact the development of a stand-alone code. Manager Huntington explained that other agencies may have provisions that differ from what this committee is helping to develop and expressed concern on how those issues should be dealt with. He further stated it is ok to have differences or if provisions align. Although energy efficiency is what the base code is about, keep in mind it is also considered a minimum code with a core based on public safety.

Robert Rice updated the committee on the document developed by the solar sub-committee "Solar Water Heating and Photovoltaic Electrical Systems Installed on One or Two Family Dwellings".

Discussion on items tabled at the September 24, 2009 meeting

Section 690.13 All Conductors

Mr. Powell clarified that the Public Utilities Commission has mandated to utility companies that they can't require "disconnecting means" within certain parameters. He further stated that even though this is a requirement from the "utilities perspective", it doesn't mean that this committee can't create a requirement from a "code perspective" for additional "disconnecting means". He reminded the committee that at the previous meeting they came to the conclusion not to delve into the issue of utility required disconnects.

Section 690.47 Grounding Electrode System

Mr. Powell explained the recommended changes agreed to at the September 24, 2009 meeting and that Building Code**s** Division (BCD) staff have incorporated those recommendations into the proposed code. The code now reflects new language as "**bold and underlined**" and deleted language as having a "~~strike-through mark~~" through the center of the language.

The committee agreed to the deletion of "note 2" in Oregon Solar Energy Code (OSEC) Table 690.47. Mr. Powell reviewed subsection D, stating that a reference to "OSEC 690.47(B)" has been added. Brian Crise asked where the language came from that is in the second paragraph. He stated that he is not aware of the language being in the current National Electrical Code (NEC). He expressed belief that if language is included in code that "requires inspections prior to cover" it could create an issue for jurisdictions who can't get to a job site to inspect a cover inspection within the given timeframe. Mr. Powell replied the language came from the current OESC, which references NEC section 250.52 for grounding electrodes.

After further discussion, committee members agreed to modify the language in the last paragraph from "*The structure of a ground- or pole-mounted PV array shall be permitted to be considered a grounding electrode if it extends a minimum of 10ft into native soil and is inspected prior to cover. Roof-mounted*

PV arrays shall be permitted to use the metal frame of a building or structure if the metal frame has been inspected and approved as a grounding electrode", to "*The structure of a ground- or pole-mounted PV array shall be permitted to be considered a grounding electrode if it meets the requirements of 250.52 of the adopted Oregon Electrical Specialty Code. Roof-mounted PV arrays shall be permitted to use the metal frame of a building or structure if the requirements of 250.52(A)(2) of the adopted Oregon Electrical Specialty Code are met*".

Motion to approve as amended Section 690.47 Grounding Electrode System.
Motion approved unanimously.

Break

The committee took a short break to review information submitted by Marcus Reed for tabled Sections 690.13 All Conductors and 690.14 Additional Provisions.

Section 690.13 All Conductors

Mr. Powell discussed the section with the committee which was tabled for further discussion on September 24, 2009. He reminded the committee that Marcus Reed, who is a representative of the fire community, agreed to research information pertaining to this section and bring it back to the committee for review. Mr. Reed explained his handout "Guideline for Fire Safety Elements of Solar Photovoltaic Systems" to the committee.

Committee members discussed AC and DC conductors at length, which included different types of safety concerns associated with each. A major concern is that an injury could occur if a non-electrical qualified person arrives on site where a fire is in progress and attempts to shut off power at the electrical box. The box or electrical components inside could be damaged and/or hot causing a safety hazard if touched. Mr. Crise suggested that committee members review national proposal number 4-228 because there may be language in it that can be gleaned for use in this section and that could help clarify the issues.

Dan Patrin, an audience member, stated to the committee that there are several companies that manufacture combiner boxes and offered a website, www.solarbos.com, which provides a list of manufacturers where components can be purchased.

Mr. Powell suggested this section be tabled for further discussion due to the importance of the issues and amount of information that needs to be reviewed. The committee agreed

Section 690.14 Additional Provisions

Mr. Powell suggested this section be tabled for further discussion. The committee agreed

Chapter VI Marking

Section 690.51 Modules

Mr. Powell explained the section and stated there are no changes from what is in model code.

Section 690.52 alternating-Current Photovoltaic Modules

Mr. Powell explained the section and stated there are no changes from what is in model code.

Section 690.53 Direct-Current PV Power Source
Mr. Powell explained the section and stated there are no changes from what is in model code, except for a reference to the OSEC. Mr. Powell reviewed language on page 3 "marking content and format", on the document provided by Mr. Reed. The committee agreed to change language in the first bulleted item from "S*olar electric system connected*" to "*Photovoltaic power source*". Mr. Powell reminded the committee that Mr. Reed's document will not be adopted, but that parts of it will be considered for insertion into the proposed code.

Section 690.54 Interactive System Point Interconnection
Mr. Powell explained the section and stated there are no changes from what is in model code.

Section 690.55 PV Power Systems Employing Energy Storage
Mr. Powell explained the section and stated there are no changes from what is in model code.

Section 690.56 Identification of Power Sources:
Mr. Powell explained the section and stated there are no changes from what is in model code.

Motion to approve as amended Chapter VI Marking, which includes portions of the document Guideline for Fire Safety Elements of Solar Photovoltaic Systems provided by Mr. Reed.
Motion approved unanimously.

Chapter VII Connection of Other Sources

Section 690.57 Load Disconnect
Mr. Powell explained the section and stated there are no changes from what is in model code.

Section 690.60 Identified Interactive Equipment
Mr. Powell explained the section and stated there are no changes from what is in model code, except where the committee proposed to change the word *"listed"* to *"certified"*.

Section 690.61 Loss of Interactive System Power
Mr. Powell explained the section and stated there are no changes from what is in model code.

Section 690.62 Ampacity of Neutral Conductor
Mr. Powell explained the section and stated there are no changes from what is in model code.

Section 690.63 Unbalanced Interconnections
Mr. Powell explained the section and stated there are no changes from what is in model code.

Section 690.64 Point of Connection
Mr. Powell explained the section and stated there are no changes from what is in model code, except for references to the OSEC and the OESC.

Mr. Rabiroff asked the committee to consider allowing disconnects on the line side. Mr. Crise asked for clarification on subsection B, number 2 on how OSEC 690.64 pertains to (B)(7). Mr. Powell replied that Mr. Crise brings up a good point and that the language *"In lieu of OSEC (B)(7), the…"* should be deleted due to the fact it is referenced in the first paragraph for subsection B. *The committee agreed.*

Motion to approve as amended Chapter VII Connection to Other Sources.
Motion approved unanimously.

Chapter VIII Storage Batteries

Section 690.71 Installation

Mr. Powell reviewed the section with the committee, stating there are no changes from what is in the model code, except for references to the OESC, OSEC and the previously agreed upon modification to change the word *"listed"* to *"certified"*.

Committee members discussed the "Exception in subsection (B)" regarding battery maintenance and additional Occupational Safety and Health Agency (OSHA) requirements for safety gear. Mr. Powell reminded the committee that although the "Exception in subsection (B)" references battery maintenance, the proposed code is an installation code and installation requirements will not directly deal with battery maintenance.

Mr. Rice suggested adding definitions into the proposed code for "dwellings" to clarify whether a dwelling refers to residential or commercial structures. Mr. Powell replied that there are definitions listed in statute, which trump code and any proposed code language. Mr. Powell suggested "importing" the definition found in statue.

Section 690.72 Charge Control

Mr. Powell reviewed the section with the committee, stating there are no changes from what is in the model code, except for a reference to the OSEC. Mr. Clements noted that for subsection (3), the model code lists the subsections as "1 and 2", not "A and B". BCD staff will correct the section numbering.

Motion to approve as amended Chapter VIII Storage Batteries.
Motion approved unanimously.

Robert Rice left the meeting at 3:45 p.m.

Chapter IX Systems Over 600 Volts

Section 690.80 General

Mr. Powell reviewed the section with the committee, stating there are no changes from what is in the model code, except for a reference to the OESC.

Section 690.85 Definitions

Mr. Powell reviewed the section with the committee, stating there are no changes from what is in the model code.

Motion to approve as amended Chapter IX Systems Over 600 Volts.
Motion approved unanimously.

Mr. Powell reminded the committee of the two tabled items, Sections 690.13 and 690.14 that will be discussed at the next meeting. He asked them to bring to the next meeting, language suggestions and ideas for "disconnecting means" for fire fighters. He also asked them to research existing manufactured products, using the www.solarbos.com web site as a reference.

Adjourn

The committee meeting adjourned at 3:51 p.m.