

Regional Technical Forum Meeting Notes

October 28, 2005

DRAFT

1. Greetings and Introductions.

The October 28 meeting of the Regional Technical Forum was chaired by Tom Eckman. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at this meeting. Anyone with questions or comments about these notes should contact Eckman at 503/222-5161 or teckman@nwcouncil.org.

2. Presentation, Discussion and Decision on Petition for PTCS Service Provider Equivalency from the National Center for Appropriate Technology (NCAT).

This parallels what we have adopted with respect to CSG, ECOS, WSU, and other PTCS service provider equivalents, Eckman said; NCAT would like to be able to do both new construction and retrofits in Montana. Their primary emphasis, however, will be on new construction.

David Hales said that, given his understanding of Jim Maunder's training and qualifications, he would be more comfortable with limiting NCAT to new construction training only. Retrofits are much more complicated to do, because you have to diagnostically find and then fix any leaks, he said. Mark Johnson said Bonneville would prefer that NCAT be certified to do both new construction and retrofits. Eckman suggested that it might make sense for the RTF to endorse NCAT's certification to do both new construction and retrofit, with the understanding that the retrofit equivalency is provisional, until NCAT can demonstrate that their personnel have undergone all necessary retrofit training.

After a few minutes of discussion, Charlie Stephens moved that the RTF be approved for new construction equivalency only until NCAT can demonstrate that they have completed the necessary retrofit training. This motion was seconded by Jim Lazar. Bruce Manclark requested that the motion be amended to stipulate that NCAT's retrofit equivalency remain provisional until David Hales attends NCAT's first retrofit training session and agrees that the training provided is adequate. The amended motion passed, with one "nay" vote.

3. Status Report on Northwest Energy Efficiency Alliance's Distribution Efficiency Initiative with Focus on Conservation Voltage Regulation (CVR).

Bob Helm led this presentation, titled "Distribution Efficiency Initiative (DEI)." Helm introduced the team that has been working on the initiative, noting that the goal of the effort is to change utility distribution practices to ensure more efficient transmission. Bonneville has estimated that 180 aMW in savings could be achieved in the region through the use of CVR. Over the years, the technology has changed, and several utilities are now modernizing and enhancing their distribution systems; however, we feel there is still a lot of potential out there, Helm said. The goal of this study is to verify that CVR will save energy, or to show that it does not.

We launched the Distribution Efficiency Initiative several years ago; it includes a load study of 475 Northwest homes, said Helm. A total of 11 utilities are working with us on that study. There is also a pilot demonstration program, involving 10 utilities and 13 substations, the goal of which is to achieve a lower average system voltage.

Moving on through his presentation, Helm touched on the following topics:

- DEI Phase I: results and products (qualified results from load research and pilot demonstration projects; decision-making tools to evaluate distribution efficiency at individual utilities; planning and design guidebook to assist utilities in implementing distribution efficiency).
- DEI participating utilities – a good selection of public and private utilities, distributed throughout the region

To what extent does your study take into account distributed generation? Stephens asked. We're not taking that into account, Casey replied – we're looking at end use. None of the 13 substations have any co-generation or photovoltaic systems hooked into them, that we know of. Still, some houses in the region do produce load, rather than draw load, said Stephens – you'll need to take that into account eventually. Some customers do have an HVR installed, but that's not a part of the study so far, said Helm. I'm a little concerned that the fact that you're not researching this could delay the implementation of what you propose, said Stephens. If your agency or anyone else would like to contribute to this project so that we can look at the effects of distributed generation, we would be happy to talk to you about that, said another presenter.

Next, Roger Wright provided a presentation titled "NEEA DEI Study Data Analysis Plan." He touched on the following topics:

- Clatskanie substation analysis
- Initial analysis
- The observed data
- Initial results (table)

- Simultaneity of voltage and kWh
- Remedy
- Identifying the control status (graphs)
- Energy print of the control status
- Classification of control status (graph)
- Verification of control status
- Effect of control on voltage (table)
- Effect of control on kWh (table)
- Beta
- Estimated beta by feeder and phase (graph)
- Impact by season
- Summary of results for the winter and summer periods (tables)
- Effect of temperature
- Interpretation of coefficients
- Winter and summer regressions for each combination of feeder and phase (tables)
- Effect by hour
- Hourly results for Feeder A Phase A (graph)
- Average hourly results (graph)
- Lessons learned from Clatskanie: the importance of clean voltage and kWh data and accurate information about the status of experimental control; naive regression analysis can lead to biased findings; beta seems to vary by end use and season; careful regression analysis can ferret out effects (betas) by season or end use.
- Unresolved question: how do the three phases of a feeder interact? Is it best to analyze each phase separately, or can they be combined?
- HVR studies – objectives: estimate the customer-side portion of the CVR effect; help estimate how the CVR effect varies with end use; help adapt the findings to various utilities and service areas.
- Targeted end-use categories
- Approach: install HVR devices in a stratified sample of homes to control the voltage (off or on) on a known schedule; do an on-site audit of each sample home; collect whole-house load data on hourly kWh and voltage; analyze the resulting data much like substation data, but rolling in the end use information to estimate the end-use effects
- Foundations for the HVR analysis (equations)
- Approach
- Results will be developed by market segments, measures of energy and demand
- The keys to success: reliable estimates of the whole-house betas for most of the sample homes; accurate estimates of the end-use energy shares; substantial variation in the end-use energy shares from home to home in the sample.
- Whole-house betas
- End-use energy shares
- Variation in end-use shares from home to home
- Concerns: limited time and money for the analysis; uncharted territory; CVR

effects are relatively small and hard to detect; may depend on severity of weather during the study period.

The full text of Wright's presentation is available via the RTF website; please refer to this document for the full details of his presentation.

The group devoted a few minutes of discussion to this presentation, offering several clarifying questions and comments. What's the time-frame on this project? Eckman asked. We'll have everything pretty much up and running by next month, Helm replied; we'll do a status review after six months to see what kind of data we're getting. He noted that it took a year to get the HVR device UL-certified. If you would like us to come back after six months to tell you what the research is telling us so far, we will be happy to do so, Helm added. That would be useful, Eckman replied.

4. Proposed Updated Specifications for Irrigated Agriculture.

Eckman said there is an existing set of WaterWise specifications; Bonneville took those existing specifications and updated them to an Excel format that is a multi-tab irrigation system review and analysis that will yield an overall system improvement proposal for a given farm. The intent of the evaluation and procedures documents is to codify what has to be done to fill out the calculator, he explained. We don't need to go through these in detail, he said, but if you have any questions or concerns, please contact me directly.

Will these documents become RTF documents? Eugene Rosolie asked. We will make them RTF specifications, if the group agrees that is appropriate, Eckman replied. Bonneville will then pick them up and publish them as part of our technical specifications, Johnson added. My concern is that both documents will need to be wordsmithed extensively before we can consider them for approval, Rosolie said; Eckman agreed that this is the case.

Using the overhead projector, Eckman then demonstrated how the proposed irrigated agriculture calculator will work. After a brief discussion, Jeff Harris moved that Bonneville accept the changes to the WaterWise specifications as outlined by Eckman. This motion was seconded and unanimously approved. It was agreed that the supporting documentation will be revised by Bonneville, and that the RTF will have an opportunity to review the evaluation and procedures documents before they are adopted in BPA's technical specifications.

6. Presentation, Discussion and Decision on Proposed Revisions to RTF Program Specifications and Northwest Program Equivalent to Home Performance with Energy Star Program Specifications.

The first topic taken up under this heading was the PTCS residential duct sealing specifications. Manclark provided an overview of the current specifications, as well as

the proposed whole-house specifications. He drew the group's attention to a document titled "PTCS Whole-House Specifications Compared to Current BPA Specifications," noting that this document provides a succinct overview of the differences between what is proposed and what is currently in place. He provided the following presentation:

- Purpose: to get ahead of the curve – allows utilities, WX agencies, and the Energy Trust to offer whole-house weatherization programs under a consistent set of specifications; avoids marketplace confusion, centralizes and controls training, and allows local control over specifications.
- The good news: only affects utilities to undertake a performance tested program
- The basics: incorporates what weatherization programs have learned in the last 25 years; treats the whole house with equal emphasis on health and safety, building durability and other factors; technicians must be certified
- Sources of standards: all combustion standards, house tightness limits and wx specifications are borrowed from successful programs, are achievable, and encourage the goals of health, safety, building durability and energy savings
- The specifics: combustion safety testing in all homes that have combustion appliances – worst-case depressurization testing, draft and spillage requirement, CO testing of all combustion appliances etc.
- All homes are blower-door tested; duct leakage testing is required on all homes with ducts in unconditioned spaces; contains shell measures
- Carbon monoxide limits (table)
- Oven and range top carbon monoxide limits
- Quality control and quality assurance – all diagnostic testing is performed pre- and post-work done by technicians on every house, by a third party
- The training – will be arranged through the Northwest Energy Education Institute; Oregon Energy training curriculum and testing will be utilized; trainers will be recognized experts in their field; prime certification will be through NEEI
- Other certifications offered: State of Oregon duct sealing certification, OECA's, BPI

The duct sealing specifications are the same under PTCS as they are under the current Bonneville program, said Manclark; the air sealing specifications are somewhat different, however. He provided a brief overview of the comparison between the current Bonneville and PTCS specifications for various factors, including house ventilation.

The group devoted a few minutes of discussion to the details of the PTCS duct sealing specifications, offering a few clarifying questions and comments. Is there currently a requirement to do a blower door test when doing duct sealing? one participant asked. Yes, Manclark replied. The main difference between the whole-house specifications vs. the previous a la carte menu is that all of the testing is tied together, Eckman explained.

I'm in favor of anything that standardizes specifications, said Hales, but what I don't understand is the relationship between blessing these standards as the RTF, and

imposing them on the region as a requirement. Again, what we have right now is an a la carte approach – doors, windows, ducts etc., Eckman said. Under this approach, we would approach house performance as a whole – a 7-course meal. You can still strip out individual components, however, he added. My concern is that this has been well-coordinated in Oregon, but not as well-coordinated in other states, such as Idaho and Washington, which has a low-income weatherization program with its own standards and training, said Hales – if we want to apply this regionally, I don't think we've touched all of the necessary bases. This is being driven by the Energy Trust of Oregon, Stephens replied; my understanding is that it is voluntary, even if the RTF blesses it. Again, you don't have to approach the house as a system – you can still choose to do individual components. The goal is a program that is less confusing and more conducive to cooperation, added another participant.

Rosolie said he has a problem with the CO/combustion standards portion of the PTCS specs – that is not our area of expertise. I share that concern, said Eckman, but the fact is, we're talking about sealing up houses that contain combustion appliances, and we have never dealt with this issue. The original Bonneville specs dealt with radon, not carbon monoxide, The point is, we don't want to increase the danger in houses that have combustion appliances by tightening them, added another participant. Basically, we would be adopting the best standards that have been developed elsewhere, said Stephens; we would be ignoring a huge problem if we say nothing about carbon monoxide. However, I wouldn't want anyone who wasn't fully certified sealing the CO-producing appliances inside my house, he added.

Is this is being put forward as something that has been vetted for the Energy Trust of Oregon, then I don't have a problem, said Hales. However, if it is being put forward as something that would be applied regionwide, then there are others in the region who should be at this table, and who aren't, currently. To just adopt this as the regional spec, without their input, will, at minimum, create bad feelings and bad publicity once they find out about it. I understand your concern, and I wish things hadn't been developed in this way, Bruce Manclark said. You will recall that the entire PTCS program started out because of a proposal from Idaho Power. There certainly are other entities who could be brought to the table to discuss this, Eckman agreed.

Does the group want to proceed on this specification, or not? Eckman asked. is there a middle ground on the question of whether this would apply in Oregon, or regionwide? one participant asked. Could we provisionally apply it only in Oregon, until we have an opportunity to confer with others in the region that would be affected? To me, Oregon or not Oregon isn't the question, said another participant – to me, it's a branding/marketing question. Will this be an RTF program? An Energy Star program? Home Performance with Energy Star is what the Trust would like to name it, Eckman said. Currently, we have four sets of specifications; this incorporates them all into a single set of specifications. Bear in mind that all of this will have to be approved by EPA – if they conclude that this meets their standards, then they will adopt it as Home Performance with Energy Star.

Rosolie said he would be more comfortable with the combustion performance standards if the source documentation for each standard included in the whole-house PTCS specs was listed.

After a few minutes of additional discussion, it was agreed to insert a definition of what constitutes “actionable spillage” to the standards. Eckman summarized the discussion, and the changes agreed to at today’s meeting, as follows: PTCS duct sealing is identical to the old Climate Crafters specs; we have the same infiltration testing and sealing requirement, except the standard is now 0.35, rather than 0.45, for mechanical ventilation; we don’t have perimeter insulation for floors; we are adding information on what spillage is and how it is measured; the CMHC minimum draft standard will replace the table that is currently shown, and a preamble will be added.

The discussion turned to the revised PTCS windows specs; which call for a Class 30 minimum, more stringent than the Energy Star standard. Roslie said that, in his view, whatever is approved needs to be consistent with what is already in place. I’m OK with leaving it at 30, Rosolie said.

Ultimately, Jay Himlie moved that this specification be adopted as modified at today’s meeting, as long as it is understood that this applies only to Oregon, at least initially. The motion was seconded and approved. The motion carries; it is now deemed equivalent to our specifications, with the exception of heat pumps, Eckman said.

7. Proposed Alternative PTCS Heat Pump Commissioning Procedure

Next, the RTF took up the question of revised residential air and ground source heat pump specifications, with Bob Davis at the helm. Davis said his intent was to focus as much as possible on the things that really matter, while producing a startup form a technician could actually use. He noted that many utilities have their own specifications, but the key point, to him, was to keep this form at the HVAC technician level. Davis went through the form line by line, briefly described how he envisions the startup form being used, and touched on the importance of controls in optimizing heat pump performance.

The RTF offered a series of detailed wording suggestions, which Davis captured within the startup form in “track changes” mode.

The RTF then discussed at length the need to establish a quality assurance system that included submission of the completed “commissioning forms” to an independent third party for review and for random sample of in-field inspections to verify that the technicians had followed the PTCS heat pump specifications. Davis indicated that he had received one estimate for the cost of establishing and maintaining a central heat pump commissioning data base. He indicated that based on approximately 500 installations per year, the cost per unit might be in the range of \$30. Stephens noted

that Proctor Engineering was in the process of adding the RTF alternative heat pump commissioning procedure to its CheckME!® program offerings but had not yet provided a cost estimate. Manclark estimated that adding the in-field inspections similar to that required of other PTCS measures to the quality assurance process for heat pumps might add \$50 to \$75 to the installation cost.

It was agreed that infrastructure was not now in place to ensure that the alternative heat pump commissioning procedure could be implemented by utilities across the region. Mark Johnson and Ken Keating said that BPA would work with utilities to see how it might best support the development of such infrastructure.

7. Next RTF Meeting Date.

The next meeting of the Regional Technical Forum was set for Monday, December 12. Meeting summary prepared by Jeff Kuechle, NWPPCC contractor.

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