Regional Technical Forum
October 4, 2011
Meeting Minutes

Introductions, Announcements, Agenda Review

RTF Chairman Tom Eckman called the meeting to order at 9:30 a.m. and asked for a round of introductions. He went over the items on the meeting agenda. Brady Peeks made a motion to adopt the agenda. David Thompson seconded the motion, which passed with all votes in favor. Charlie Grist reminded the RTF of its conflict of interest policy.

Eckman asked if there were additions or corrections to the meeting minutes from August 30. Mark Jerome made a motion to adopt the minutes. Brad Acker seconded the motion, which passed with all votes in favor.

Eckman announced that the RTF Policy Advisory Committee (PAC) met September 30. The PAC gave the RTF "a new lease on life," agreeing to provide financial support for three years at an annual budget of $1.5 million, he said. The RTF will be able to add a full time staff person with the added funding; a job description and posting will be written as soon as possible.

Heat Pump Water Heaters

Kacie Bedney presented results of a customer satisfaction survey related to heat pump water heaters (HPWHs). She described the EPRI/BPA demonstration project in which survey respondents participated, including the brands of HPWHs, utilities involved, and the research objectives. Bedney said the project had HPWHs located at 40 sites and all participants had their water heaters for at least six months prior to the web-based survey being conducted. Of the 40 customers, 36 responded, she said.

Bedney went through the customer responses that compared the HPWH performance with an all-electric unit. The questions related to overall performance, satisfaction with the temperature and amount of hot water, changes in air temperature around the unit, changes in the electric bill, and the noise level. The survey also asked how the unit was being operated, she said. The customers were asked if they would purchase an HPWH again, and 12 said yes, 12 said no, and seven said maybe, Bedney reported.

Ken Keating asked if researchers found a relationship between satisfaction and willingness to purchase an HPWH and the brand installed during the demonstration project. Bedney said most comments focused on the cost, not the brand. Keating said it would be interesting to see if there was a correlation between satisfaction and brands that produced less hot water.

The RTF had questions about the customer responses, including whether diminished satisfaction with noise related to indoor installs; the HPWH recovery time; whether satisfaction with performance related to infill temperatures; and whether the period of operation included both warm and cold weather.

Rich Arneson commented it was disappointing if only 39 percent said they would purchase an HPWH again. Jeff Harris pointed out the study sample was small and extrapolating the results to all of the population "is dangerous." Bedney agreed it was a small sample. She said results

from a study being conducted at 160 sites around the country would soon be available and would provide more data.

Keating said it is worrisome if early adopters are setting the water temperature higher; we will see losses in savings. Bedney said a majority of people in the survey operated the HPWHs at the default temperature. Eckman commented that the correlation between customer satisfaction and HPWH brands is important.

A participant from Puget Sound Energy said PSE conducted a customer satisfaction survey on HPWHs and would share the results. We had a high satisfaction rating; out of 182 customers surveyed, 110 responded and most had a favorable response to HPWHs, he said. We found 75 percent of respondents had installed a GE appliance; 90 percent said they would recommend it, and 92 percent said they were satisfied with the performance, he stated. Most participants bought the HPWH from a big-box store, locating and installing it on their own, he said.

Grist said the RTF should get the PSE data, and he would be anxious for the results of the 160-customer survey. He noted two questions: are HPWH users setting the temperature higher than they would with a regular unit, and if they are running out of hot water, are they changing the operating mode. Are we picking up the energy effect of that customer behavior? he asked. Adam Hadley said such data would be picked up based on the field coefficient of performance (COP).

Thompson asked about changes in the customer electric bill. Bedney said the researchers are not looking at a billing analysis. Thompson asked if the researchers are seeing greater energy efficiency. Ben Larson said they were. We can see in the data that the efficiency is greater than one in most instances, he said. Bedney noted that EPRI provided an extensive metering package that collects a lot of data.

HPWH Unit Energy Savings (UES)

Hadley presented a proposal for HPWH UES, highlighting several changes made to the HPWH analysis since the last RTF meeting. He presented the measure summary, a summary of the UES analysis, and he listed the measure identifiers in detail. With regard to the HPWH installation location, Hadley said he pushed hard to have a definition for an unheated buffer location. The RTF had several questions about the elements in the measure identifiers, including the description of the buffer location as not having a heat supply "under thermostatic control." David Baylon said without that distinction, waste heat from an appliance could be considered a heat supply.

Hadley explained the constant parameters in the analysis. Lauren Gage asked about the consumption data and whether it was the same as that used for standard water heater analyses. The RTF discussed the appropriate data to use for hot water consumption and noted studies that could shed light on the figure. Harris said the UES analysis "is probably as good as we can get" now, but could be revisited in a year when more study information is available. Hadley noted that measuring consumption is an item in the proposed study plan.

Larson explained the values and weightings used for the heating/cooling system efficiencies. He responded to RTF questions about the weightings. The RTF discussed whether a "last measure in" analysis was most appropriate for the HPWH measure. Mike Baker clarified that

the RTF guidelines allow for making a case to use an analysis other than last-measure-in for determining UES.

The RTF discussed the potential effect of the values for system efficiency on HPWH savings. Arneson questioned modeling system efficiency as it would be in 20 years as opposed to the current state. Harris said the important thing is to be consistent. Jack Callahan pointed out that the interaction of appliances could be quite complex and could "cut both ways," depending on the dynamics of the situation.

Eugene Rosolie clarified that the proposal is a provisional standard for HPWHs in buffered spaces but not interior spaces. Hadley said the assumed values in the analysis would apply to both, but in the current proposal we don't have the numbers for Tier 2 (Northern Climate specification) applications.

Harris said the question for the RTF is whether to use the last-in approach to modeling the UES or something else. There were questions about whether there is good data on the current appliance stock to use in the analysis and whether the system efficiency values and weightings would have a large effect on the outcome of the analysis compared with other factors, like water temperature and occupancy.

Arneson asked if the modeling should include converting the customer to a gas water heater. This looks like "back-door fuel switching," he said. Eckman said the fuel choice study shows an HPWH and gas water heater "are a jump ball." Harris said if a customer is opting for an electric water heater, "it is probably a sure bet there is reason it is still electric." If customers could have gone gas, they would have, he said.

Hadley went on to describe the remaining parameters. Eckman noted the weightings for tank size should be based on the fuel choice study. Hadley explained the circumstances under which the COP changed in the analysis, and he described the temperature profile used for the unheated basement and garage areas. He went on point out changes that were made in the cost of the measure, noting the lower price for the HPWH units than the price used in the previous analysis. The RTF discussed whether the price reduction reflected in the analysis was permanent or temporary.

Hadley explained the weightings in the analysis for heating zones, HPWH installed location, and the tank size, as well as the assumptions for baseline energy use. He also explained how the variables were combined to arrive at the annual savings.

Hadley wrapped up with the benefit/cost analysis and overall results, which he said show the proposal to be cost-effective. He said changing the cost of the HPWH from $1,000 to $1,400 could have an effect. There are plans for additional UES, Hadley said, explaining that the Tier 2 interior installation will require exhaust ducting and that analysis isn't yet available.

The proposal for provisional savings includes a study design, and he explained the approach is different from other studies. Grist said it might not be "a one-step jump" from the provisional classification to deemed savings for the HPWH measure.

Harris said there would be another round of model improvements and changes. The study design will validate the engineering model, he said, adding that there are "behavior impacts" with HPWHs that can only be addressed through large statistical studies. We don't have the

resources to go after that at this time, but we can reasonably go for other data, like water heater tank size and usage, Harris said. He noted that there are a lot of technology changes ahead for HPWHs.

The RTF discussed the value of a billing data analysis during the provisional period for the measure.

Hadley described the study design, including the three primary data collection areas: hot water consumption, space conditioning interaction, and in-field COP. The provisional sunset date for the measure is three years, he said. Hadley went through details of the data collection plans in the three areas of study. The RTF asked questions about how monthly hot-water consumption will be measured. Hadley said the in-field COP is the most complicated area to study.

Arneson suggested the study also collect demographic information, and Hadley and Harris agreed. Harris said there had been discussion about metering the space-heat interaction, and the RTF discussed how to get baseline data to get at that interaction.

Hadley presented the measure checklist, and Arneson asked about the assumptions for programmatic costs and said his staff is concerned about HPWH implementation costs being higher than for other measures. We always use 20 percent, Hadley said, adding that it would be unprecedented for the RTF to treat programmatic costs for HPWH differently.

The RTF had more discussion about the cost. There were questions about the benefit/cost ratio, and how it would be affected by the unit cost of the HPWH. And the RTF members discussed the appropriate figure for the HPWH unit cost. After several suggestions for the cost, including that the number be set to deliver a 1.0 b/c ratio, Baker clarified that cost-effectiveness should not be part of the discussion about the reliability of a measure's UES. Hadley agreed that the question is whether the costs used in the analysis are right.

Hadley went on to list "open issues" in the analysis, including the reliability of the baseline energy use, study design, and the analysis approach, as well as the sunset date and measure life. Thompson asked whether there had been sensitivity analyses done on how the UES is affected by the hot water use per day, occupancy in the household, and other factors. Harris said the UES will be very sensitive to usage, and Baylon said in other studies the relationship between the two is linear.

The RTF discussed the difficulty in deciding on the appropriate consumption figure to include in the analysis. Harris said the analysts considered using large and small tank size as a gauge, but there are challenges in that approach. Water demand has had little impact on how we would calculate the savings, Baylon commented.

Keating made a motion that the RTF approve the UES for Heat Pump Water Heaters, based on the numbers in the analysis, under provisional status with a sunset date of December 31, 2014 and that the cost data provided is the best estimate at this time. Peeks seconded the motion.

Thompson said he was concerned about voting on UES that have still-to-be-determined savings. Keating clarified that his motion did not include Tier 2 interior locations. Harris said approving the motion would include Tier 2 unheated buffer locations.

Arneson said he is concerned "we are not quite there yet" with a couple of the costs and efficiencies. He also said the fuel-switching issue has not been thoroughly discussed. Eckman said that wouldn't bear on the UES. That is a program consideration, and it doesn't affect the savings, he said.

Hadley clarified that the motion is for the UES with the proposed costs and efficiencies. Keating said he would put the cost of the HPWH at $1,313 per unit.

Bill Koran said the RTF has the information that is reasonable to have at this point for approval. The assumptions are conservative, which gives me comfort, he said. Koran asked if there is any information about unit performance degradation over time and whether there will be a need for service.

Harris said that information isn't available and units on the market have been out for less than a year. But there is reason to expect the manufacturers will get this right, he said. They are putting 10-year warranties on the units and putting their reputations behind these devices, Harris stated.

Tom Eckhart asked about any requirement to keep the coils clean, and Larson said the coils are protected by a filter. In tests, the compressor performance degradation was less than 5 percent even with restricted airflow, he said.

Andie Baker said the issue is difficult and lots of good work has been done. She said she was struck by the customer satisfaction data, with as many reporting they wouldn't buy the appliance as said they would. And half were operating their units on the high side. There are unanswered questions, Baker said.

We are talking about a provisional UES recommendation, Grist said. A key element here is the research plan to move the measure to an active UES or to make incremental improvements in the provisional measure, he said. The key question is whether the research plan will gather the right data, Grist said. We have a list of half dozen items on which we need to determine if the numbers are right, he said. The RTF has two questions to consider, Grist stated: is the measure ready for provisional? And if not, what will it take?

The RTF discussed the study plan. Should we get a group of evaluators around the table to discuss the research plan? Grist asked.

Keating suggested he amend his motion to include an RTF subcommittee to guide the research plan. Mark Kendall reread the motion with the amendment as follows: The RTF approves the HPWH UES to include Tier 1 systems in all applications and Tier 2 systems in unheated buffered locations on a provisional status with a sunset date of December 31, 2014, with the study details to be directed by an RTF subcommittee. Keating agreed with the statement of the motion and Peeks agreed to second the amended motion.

The RTF voted in favor of the motion, with one vote cast by Arneson in opposition.

Staff Subcommittee Updates

Kendall reported on the September 16 Operations Subcommittee meeting and gave a recap of the items discussed. He said the November 1 RTF meeting would remain as scheduled. Kendall

said Requests for Proposals will be published soon for the measurement and verification guidelines, and the end-use load study business case and he invited RTF members to indicate if they would like to participate in the proposal reviews. He announced that the Small Rural Utilities Report has been completed and the recommendations are being finalized.

Grist reported on the RTF PAC meeting, noting the RTF got "the green light" to go forward with its work for three years. The PAC looked at the RTF work plan. We need more engagement from RTF members to develop the work plan "so we know we are working on what the region wants," he said. The PAC will have a conference call in October or November to review the RTF bylaws, Grist said.

Eckman summarized the PAC's interest in the work plan as making sure the RTF is addressing measures, issues, and technologies that are best addressed communally as opposed to by individual utilities. He asked RTF members to look at the work plan and make sure it contains the right items. Grist said the PAC would meet about twice a year and review how well the RTF has been doing. Having them endorse our charter and bylaws is a big step, Keating said.

Mike Bailey asked if there was a discussion about the greater need for RTF services and how it would be funded. Grist responded that unless the structure of the RTF is changed, "we can't see a lot bigger volume of work." The current structure and reliance on volunteer time, constrains what we can handle, he stated.

Kendall said the domestic heating fuel choice study will be on the RTF agenda in November. Eckman said the staff's analysis is out for review internally and the results will be presented in November for RTF comment. Kendall went on with other announcements, including the Northwest Research Group meeting and dates for posting analyses on CFL delivery methods.

Grist reported on activities related to the variable capacity heat pump and standard protocol for Fan VFD measures. He said he would be requesting Fan VFD subcommittee participation in October, noting staff is soliciting additional members to review the calculator and would send out a notice asking for volunteers. A contract for more RTUG work is in place, Grist said. He went over the status of other contracts, including Measure Life and Measure Review, and asked for more RTF participation with the Measure Cost analysis.

Kendall reported on the initial staff review of UES measures. By the end of the year, we plan to have all UES measures reviewed and work plans in place, he said. We may ask for an extension of the sunset date for some measures if more time is needed, Kendall said. He said staff is looking forward to more subcommittee participation as the contractor develops memos for further work, he said. Kendall recapped the status of the review: of 79 UES measures, 16 have been reviewed; 60 remain; and three are recommended for deactivation. He also provided more detail on the status of specific measures.

Grist listed criteria staff used in the review and described how the work would proceed. This is an opportunity for utilities to weigh in and we would like your participation on the subcommittee, he said. It may be there are measures "with no champion," and we want to choose which measures are worth the additional effort, Grist said.

Kendall said a lighting subcommittee is being formed, and staff is seeking more participants. A meeting is scheduled for October 19, and a notice will go out to the RTF, he said. A SEEM

training session is scheduled October 31, Kendall said. The session is to familiarize people with the model and is not a "hands-on" training event, he added.

Jill Steiner asked whether utility staff can participate on subcommittees and suggested if so, there be an orientation about their role. Grist said staff is welcome and subcommittee chairs are obliged to remind participants about their role. Eckman agreed, saying RTF members don't have to act as a go-between when their staff members participate.

Rosolie said the website Conduit would help get the RTF subcommittee work disseminated more broadly. He suggested using the site to post information.

Hadley said a one-page guide to subcommittee participation might be appropriate. Based on our discussions with small utilities, it seems like a good idea to have someone get people familiar with how to participate, Baylon said.

RTF Work Plan and Budget

Grist presented the 2012 RTF Business Operating Plan and Funding proposal. He went over details of the planned RTF activities, along with the budget categories, explaining how he arrived at the budget figures. Grist gave the three-year outlook for the budget, which includes adding RTF staff. He went on to a table of the region's total evaluation budget, $13.6 million, and the portion the RTF's $1.5 million budget represents. Eckman said the RTF needs to do a good job of coordinating its work with the other 90 percent of regional evaluation spending. We need to assure less redundancy and more collaboration, he said.

Koran said the RTF work should decrease what others have to spend on impact evaluation.

Grist described how the RTF builds its work plan, looking at measures with an obvious regional scope and large program savings or high unit count. He said there are also measures for specific needs, which other proposers initiate. The RTF also does technical analysis on request from others. The first category of work is known and schedulable, but the other is not predictable, Grist said, adding that the RTF needs an in-year process to deal with requests.

The PAC will be doing a late-year assessment of where we stand with our work plan, he said. Grist said staff would like RTF comments by October 21 before the PAC meets again.

He went on to list several categories where major work is needed, noting that more tools need to be developed. Grist listed specific areas where data needs to be developed.

The RTF discussed the work plan presentation, including the best approach to collecting data and how a utility could tap into RTF expertise on measurement and valuation. Eckman pointed out that NEET will meet again and that developing a business case for collecting end-use data is on the agenda. The RTF discussed how to encourage more engagement in developing the work plan. Grist suggested members write down what UES they would like to get through the RTF in 2012. It would help staff gauge the resources to dedicate to that activity, he said.

Kendall said the RTF would try to schedule a conference call before October 27 to go through the work plan in greater detail.

Smart Power Strips

Danielle Gidding introduced the presentation on Smart Power Strips, which she said aims at updating the UES and moving the measure from provisionally deemed to active status. The updates are based on a study conducted by BPA, she said. Gidding provided background of the measure, which was given provisional status by the RTF in March 2010, and described elements in the research plan BPA conducted. She said the measure was originally deemed for three types of power strips, but the current UES is for load-sensing strips.

Lela Gallert described the metering study BPA conducted on strips installed at the Ross Complex, including how the data was collected. She said users were aware of the strips but did not necessarily know when pre and post measurements took place.

Gallert went over the test results. The RTF asked questions about the conditions under which the data was collected. With regard to baseline energy use, Kendall said an Idaho IDL study provides data about energy use in office cubicles.

Gallert said she ended up with data from 45 cubicles and calculated per strip savings of 132 kWh per year. She offered a graph that displayed the number of devices plugged into the power strip. The RTF discussed the impact of a laser printer on data from one cubicle that showed a significant savings, and there was discussion of whether to use the median or mean for the savings number. There were proponents of using each. And the RTF discussed whether the BPA sample from the Ross Center is representative of the entire office landscape.

Gidding went over the measure cost calculation and said measure life is four years, as it was in the provisional measure. Using the 132 kWh savings, the cost-effectiveness is 2.51, she said. Gidding described the measure workbook results.

The subcommittee had lengthy discussion about the baseline, Gidding said. Kendall pointed out that the subcommittee discovered Acker was doing a study that would provide useful data for analyzing the baseline. The IDL and data from a study by ECOS provided a basis for comparison, he said.

Gidding listed the proposed measure requirements. She said BPA is aligning the measure specifications with what occurred in the study.

The RTF discussed whether there was double-counting of savings if a PC network management system is in place, and Gallert explained why the power strip savings are cumulative with PC management. The RTF questioned whether to require occupancy of a minimum 50 hour per week for the measure and discussed options that might be more appropriate.

Questions were raised about the HVAC interaction, and Gallert said the researchers thought the interaction was “a wash.” There was also a question about the potential for the measure to be widely used. Gallert said she thought there was such potential once information about the strips gets out.

There was discussion about the cost, whether the measure savings should remain provisional, and whether the BPA study was representative of all offices.

Bailey suggested a motion could require getting additional data. But if the measure is put out as provisional, utilities don't use it, he said. Here's something that could be huge savings and could take off really fast; let's do it, Bailey said. Gidding agreed that one of the barriers in the provisional status is that it requires data collection.

Hadley made a motion to give active status to the UES for the load-sensing power strips with a sunset of five years or 100,000 units, whichever comes first. Rosolie seconded the motion.

Don Jones, Jr. asked who would count the units and whether the motion commits everyone to the count. Keating said the measure is cost-effective and there isn't much risk. Eckman asked if a three-year sunset without the 100,000 unit requirement was acceptable. Hadley said he would amend his motion and Rosolie agreed to second the amended motion. Hadley restated that his motion would be for an active UES of 100 kWh for three years with no unit count. There was a call for the vote, and the motion passed with all votes in favor.

Ground Source Heat Pump

Hadley provided background on the proposal for the technical specifications on Ground Source Heat Pumps, going over the measure summary and the specification review, which involved a subcommittee and opportunity for public comment. He said the subcommittee didn't reach consensus on the open loop system. Peeks explained his dissent on allowing open loops, saying he had seen problems with these types of systems when he worked with Oregon DOE.

Hadley described the public comments and said the subcommittee reviewed them and made changes to the specification as a result. Mark Jerome said the 25-degree balance point in the specification is a maximum not a minimum, and Hadley said he would make that change. There was also a change to language on the control of auxiliary heat.

Peeks asked whether the GSHP subcommittee members oppose any of the changes Hadley made. Jerome said there were a few things that didn't work well but they hadn't been changed. For example, he said the table on pipe length is not realistic. It might fit well with the energy savings, but it isn't practical since pipe lengths come from the manufacturers in certain lengths and people don't want splices, Jerome said. The RTF discussed the table, and Jerome suggested the table indicate the pipe sizes were recommended but not mandatory.

Larson said the critical element for savings is the water temperature when it enters, not the pipe length. There was further discussion about the pipe length and water temperature.

Hadley made a motion to adopt the GSHP Subcommittee's final proposed residential Ground Source Heat Pump System Installation Standards as amended at the RTF meeting October 4, 2011 and change the UES measure status to active. Peeks seconded the motion, which passed with all votes in favor.

Hadley made a second motion that the RTF approve a Scope of Work for a contractor to develop specifications for open-loop systems, not to exceed $10,000 in budget. Rosolie seconded the motion, which failed on a vote of 7 in favor and 8 against. Jerome abstained from the vote.

The RTF meeting adjourned at 4:37 p.m.

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