

Regional Technical Forum Meeting Notes

May 22, 2007

DRAFT

1. ***Greetings and Introductions.***

Tom Eckman welcomed everyone to today's meeting, held May 22 at the Council's Portland offices. 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.

The minutes from the February and April RTF meetings were approved with a few minor changes.

2. ***Update on Results of Revised Deemed Measure Calculations For.***

- a. ***Low-Flow Showerheads.*** Eckman demonstrated the results for this revised deemed measure calculation, using the overhead projector. The group offered a few clarifying questions and comments. After a few minutes of discussion, it was moved that this be a 10-year measure life, revised from 15 years. This motion was seconded and unanimously approved.

Does this apply to manufactured and multifamily homes as well? Adam Hadley asked. The analysis was done on single-family homes, but I can't imagine that it won't also apply to manufactured and multifamily homes as well, Eckman replied – the weighted average GPM per showerhead, about 2.5, is similar in all cases. However, I don't have the data to present today to back that up, Eckman added. After a brief discussion, the RTF agreed that this should apply to multifamily and manufactured homes as well.

- b. ***Hotel/Motel Room Lighting Occupancy Sensors.*** Charlie Grist said that, the last time this was discussed, the group approved a pending deemed measure calculation. Using the overhead projector, he provided a presentation touching on the following major topics:

- Update: approved last time pending cost-effectiveness analysis; energy analysis based on Pier study by Arch Energy; cost based on estimate by ETO.
- Shape of savings (graphs)
- Savings calculations (graphs) – 145 kWh on average for incandescent, 43 for CFLs (lower bulb cost for CFLs). Positive B/C ratios for both new and retrofit installations for incandescent bulbs, negative B/C ratios for CFLs.

The group devoted a few minutes of discussion to this issue, offering a series of clarifying questions and comments, most centered on the issue of CFL cost-effectiveness, given the fact that it is the general policy of the RTF to encourage the maximum use of CFLs. This is essentially a consensus judgment call on risk, Eckman observed – for new applications it's a slam-dunk, but retrofits are more problematic.

Ultimately, Grist said he will work with Greg and Jill at the Energy Trust to spec out the minimum effective wattage for this program and will bring the results of this analysis back to the next RTF meeting. An RTF participant moved that this issue be tabled for this meeting; this motion was seconded and approved.

- c. **Energy Smart Grocery – Anti-Sweat Heaters.** We noticed last time around that the savings for medium-temperature applications were very low in the analysis we were looking at, Grist said. He provided a presentation, touching on the following major topics:
- Revise ASH savings estimate: anti-sweat heater (medium temperature); controls – anti-sweat heater (low-temperature). These changes are relatively minor, Grist said.
 - More adjustments to savings (table): CFL for walk-in cooler/freezer, hardwired T8 walk-in etc.
 - The revised savings calculations (Excel table)

On the CFLs in freezers, the report I gave you this morning indicated a one-third failure rate in the first year, said Ken Keating. That saves a lot of electricity, Grist observed. I'm not sure how that fits into your calculation, but that doesn't seem to be an acceptable measure life, Keating said. After a brief discussion, it was agreed to consider whether this is a supportable measure at the next RTF meeting.

A motion was made to adopt these deemed savings. This motion was seconded and unanimously approved.

- d. **Review of Cost Data on Commercial Premium HVAC.** We were trying to look for a program in improved efficiency in small packaged HVAC systems, said Grist. We wanted to look at incremental cost and on whether there are effective economizers for these units. We looked at

some recent Oregon survey data that showed costs in the range of \$250 per ton, about 10 times higher than the costs Tim was using in his analysis. Jeff Coles also provided some data, which showed costs for Carrier Weathermaker and Centurion units. Tier II incremental costs were in the same cost per ton range. This is not definitive, said Grist, but it is significant.

After a brief discussion, there was general agreement that this information has the effect of wiping this measure out, from a cost-benefit perspective. We have some more sleuthing to do, said Grist, but that's the way things are looking at this point. We'll kick this back to the committee, see whether there is any new data, and re-run the calculations to see how they come out.

- e. **Mini-Splits.** We need to create a subcommittee to look at the next steps to moving the mini-split technology to market, said Eckman. I was informed yesterday that the Alliance has some money to help move this along, as does Bonneville. We also have some funds to investigate new technologies in the RTF budget, he said. The subcommittee will need to develop a scope of work, Eckman said. Mark Jerome, Adam Hadley, David Hales, Brady Peeks, Rich Arneson, Jeff Harris, Bruce Manclark and Jeff Pratt agreed to participate in this subcommittee.

Hadley briefly described this technology – a smaller outdoor unit attached without ductwork to multiple indoor units. The main benefit is the fact that these are essentially cold-climate heat pumps that run at variable speeds; they can also be retrofit, added another participant – it's a pretty exciting technology. They offer the opportunity to zone the house itself for heating and cooling. It has an HSPF rating of 8.2 to 10, which caught my attention, he added, as did the relatively low cost of the technology

3. ***Presentation, Discussion and Decisions on Proposed Determination of Equivalency of Aerosol Duct Testing and Sealing Protocols with PTCS Protocols for New Construction.***

We would like to deem aerosol duct testing as equivalent to PTCS, said Bruce Manclark. Mark Modera of AeroSeal led this presentation, touching on the following major topics:

- How the process works (animation)
- An actual seal (photograph)
- AeroSeal product: technology
- Every sealing job is run by a laptop computer; all data is stored and uploaded to a central database
- The sealing process: automatic documentation

- FAQs: does not coat the ducts, vinyl polymer is safe, no lingering odors or off-gassing, lasts 10+ years, seals holes up to ½-inch across, sealant remains rubbery, no need to clean after sealing
- Brief history: development of this product has been ongoing since 1994; AeroSeal purchased by Carrier in 2002; more than 25,000 residential systems have been sealed to date.
- Training program – testing protocols, sealing protocols, combustion safety
- Training: check gate opening
- Training: gate selection
- Training: pre-sealing leakage
- Training: seal it
- Training: post-sealing leakage test
- Training: certificate of completion
- Training: combustion safety test
- Training: worst-case scenario
- Product longevity – Carrier provides 10-year warranty, warranty based on four years of accelerated testing etc.
- Compatibility with Duct Blaster
- AeroSeal product delivery – franchises, equipment sold by Airefco.
- Additional product applications, including sealing manufactured home ducts and AeroSealing large commercial ducts

Modera offered the following conclusions:

- Requesting approval as residential duct sealing option for new construction
- Eventual approval for other applications.

So this is a Carrier product and all data is uploaded to Carrier – do contractors have to be affiliated with Carrier? asked Jeff Harris. Airefco can sell it to whoever they want to, but in California, we're registered as a third-party quality control provider, Modera replied – we check everything the contractor does, though not necessarily on every job. Essentially we run "cheating checks," he explained. What about large leaks and disconnects? another participant asked. We teach our contractors to walk the system, Modera replied. Additionally, you know what the graph is supposed to look like, and if there is significant deviation, the contractor goes around and looks for big openings. In response to another question, Modera said it would be a simple matter to run the test at 50 pascals, rather than 25.

The cost of duct sealing for new construction has been hard to pull out, said Manclark. What we're hoping to do with this is that some contractors adopt a similar business model to that used by Oasis Heating in California, where one individual can do up to five jobs per day in a subdivision. Initially, we hope to see this used in Energy Star new homes, he added.

Right now all PTCS data is collected and uploaded to Bonneville, said Eckman – would this work the same way? It could – the data can be made compatible with that database, was the reply. Why can't you use this for retrofit? asked another participant. The chain of reporting is different, Manclark replied. Ultimately, we should be able to use it in the existing home program, but that's not the request that is before you today, Modera added.

After a few minutes of further discussion, it was moved that the RTF approve AeroSeal as equivalent to PTCS, with the caveat that 50-pascal data be made available. This motion was seconded and unanimously approved. In response to a request, Eckman said he will post this presentation to the RTF website very soon. It was agreed that the RTF will consider what is necessary to approve this technology for manufactured homes and retrofit at a future meeting.

4. *Presentation, Discussion and Potential Decisions on Petition to Establish Deemed or Deemed Calculated Savings for a "Green Motors Management" Program.*

Jeff Harris led this presentation, touching on the following topics:

- In 1994, electric motor-driven systems used 679 billion kWh or 23% of all of the energy sold in the U.S.
- In today's energy climate, motor service centers and their influence should not be overlooked.
- Many energy efficient motors are reaching the end of their life and will need repair – it is time to address this issue
- Without attention to controlled motor repair protocol expect efficiency losses of 1% if the motor is 40 HP or smaller, and .05% if 50 HP or greater. With Green Motor protocol, expect no efficiency losses.
- Prolonged efficiency unchanged even after five rewinds, but it requires a controlled process – a failure event does not affect the motor core.
- New motor losses – what is the rewinding effect?
- Green motors service centers sign a commitment to: retain efficiency in the repair/rewind process, base recommendations on the total cost of ownership, train personnel and allow GPG inspection and review, advise customers of catastrophic failure etc.
- Deemed savings (table)
- High quality motor repair estimated savings
- Sample incentive application
- Green Motors practices group – goals and attributes. Retains efficiency, is cost effective, reaches even custom-made motors, will lead to uniform utility programs, bolsters the bottom line of commercial, agricultural and industrial community, is virtually plug-and-play, and is an energy-efficient measure.
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These numbers are based on a 1% efficiency drop for motors less than 50 HP? said Baylon. Correct, was the reply – your I-squared-R losses are reduced because total resistance drops. To what extent can you predict motor efficiency? Baylon asked. Unless you actually run a dynamometer test, you really can't – you have to go with the numbers on the nameplate, was the reply. Basically, what we've done here is to take a conservative approach and claim limited gains in efficiency, Harris added.

The group discussed resistance to this concept among non-participating service shops and customers, as well as incentives to replace or rewind “dog motors.” One possibility is finding ways to help customers to replace “dog motors” with NEMA premium motors, one participant suggested.

The group devoted a few minutes of discussion to this issue, touching on record-keeping issues and methods to document savings, assumptions for agriculture, food service and other seasonal applications, the need for lifetime data, and annual O&M savings/costs associated with rewinds. Baylon asked that a paragraph explaining how net efficiency gains would be demonstrated would be helpful. Tech note 16 explains the shop practices that were used, was the reply.

Ultimately, there was general agreement that, while the RTF is not ready to make a decision on this issue, the group wants to see progress on this issue. Harris said he will bring additional information on the cost-effectiveness of this measure to the next RTF meeting.

5. *Presentation, Discussion and Decision on Energy Star Home Deemed Savings for Basement Homes.*

We first took this topic up last year, said Eckman. Using the overhead projector, he touched on the following major topics:

- Major changes: lighting/space conditioning interaction, thermostat night set point lowered, half-basement prototype (eliminated), baseline home glazing, basement prototype, LPD reduction “realization rate” increased, baseline home LPD increased, baseline home duct system leakage increased, baseline water heater EF increased, Energy Star dishwasher savings increased.
- Assumptions – lighting package, duct leakage, thermostat settings
- Results (graphs) – adopted two meetings ago

There was general agreement that there may be a glitch in the Zone 3 “Impact of lighting and space conditioning interaction on gas use” results. We'll correct that and circulate the results to the RTF via email, Eckman said – we need to submit this soon so that it can be included in the new edition of the Salmon Book.

After a few minutes of discussion, Harris moved that the RTF approve these numbers with the caveat that the corrections agreed to at today's meeting will be made. This motion was seconded and unanimously approved.

6. *Presentation, Discussion and Decision on Establishing Minimum Solar Heat Gain Coefficients for Class 30 Glazing.*

As we were reviewing Oregon code, an issue arose as to whether, by specifying Class 30 windows, there might be an issue related to solar heat gain, Eckman said. David Baylon led this presentation, titled "Window Performance Parameters," touching on the following topics:

- Window U and SHGC analysis – designed to jointly review the performance of windows with U-values below .35; EStar prototype used with 2200 sf and 16.7% glazing; SHGC and U distributions based on about 45,000 tests in the NFRC database; only vinyl-framed, double-glazed windows used
- Window characteristics (graph)
- SHGC by U-value bin box/whiskers plot)
- Product distribution at fixed SHGC (table)
- Results: Seattle (heating only) -- graph
- Results: Missoula (heating only) – graph
- Results: Boise (heating only) – graph

Baylon offered the following conclusions:

- In higher-performance windows ($U > .34$), SHGC should be specified to ensure performance
- Analysis suggests that fixing the SHGC at a minimum value (.33) [there was more – see presentation on the net].

After observing this industry for a number of years, there is one thing I know, said Eckman: if you tell this industry what to build, they will build it. If we can produce some analysis that says we want low U-values, but we also want favorable SHGCs, then we could write a spec that makes sense for this region, Grist observed. One concern was the Oregon code process will be deciding by the end of June whether to go to a .32 standard, and the question is, should we try to insert something into that process to ensure that we get actual savings out of that measure, Eckman said. There are still plenty of places to push windows, Baylon observed.

At some point, we need to engage Energy Star and tell them we need a different spec for the Northwest, said Harris. Knowing the market dynamics would facilitate a discussion of changing the spec to .30, with a favorable shade coefficient, at the national level, Harris said.

After a few minutes of further discussion, Harris moved that the RTF hire Gary Curtis or someone like him to talk to the manufacturers to find out what the parameters are around .32, .31 or .30 coefficient – how long it will take to get there. In other words, he said, we need a general market assessment of what it will take to get to a different coefficient. This motion was seconded and unanimously approved.

7. Presentation, Discussion and Decision on PTCS Carbon Monoxide/Combustion Appliance Testing Requirements.

This group owns the PTCS trademark; whenever anyone wants to make a change to the PTCS program, they have to request that change from the RTF, said Brian Boe. This particular issue was referred to an RTF subcommittee, which didn't like our idea. Brady Peeks proposed a compromise, which would make combustion testing a safety requirement. That way we wouldn't have to worry about the carbon monoxide alarm. The spec is a menu which gives you that option. Last May, the subcommittee voted 4-2 to approve the compromise. We assumed that recommendation would then come to the full RTF for a vote, Rice said.

Nothing happened, however, Boe continued. There was a telephone meeting on this topic last December, at which a number of issues were raised. There was also agreement to bring the subcommittee's recommendation to the RTF for a vote. I have provided a backgrounder at today's meeting that describes the history and technical background of this item, Boe said. We're asking that the RTF complete the process and vote on the subcommittee's recommendation at today's meeting, said Boe.

Fundamentally, the question before us is whether you should have to do both CAZ testing and the alarm, or do either/or, Eckman said. Manclark said that, in his view, the PTCS specs have always been deficient when it comes to combustion safety; his preference is to require both testing and the carbon monoxide alarm. Boe said the Oregon program has been going for 13 years and they haven't really seen an issue with this. There is also the Energy Star new homes program, which means this effort needs to make three programs line up. Another participant noted that, in his fieldwork, about 10% of the time, the homes he visits have a carbon monoxide problem and the occupants don't even know it. We install CO alarms as a matter of company policy, he said – I don't see a problem with including that requirement in the specs. There are many situations where it would be beneficial to have both, he said.

The discussion turned to the question of liability; Eugene Rosolie said that, in his opinion, determining liability is not the RTF's role. Ultimately, Baylon moved that the RTF not accept the subcommittee's recommendation, and instead retain the current PTCS specifications. This motion was seconded. Another participant, who said she is not a voting member, said that, if all of these programs are

available to customers, they need to be similar enough so that they can be implemented by her utility's vendors. There is a small increment of technical requirements that are making it very difficult to implement these programs and to get vendors to participate, she said.

The motion was approved.

8. *Presentation, Discussion and Decision on Ground Source Heat Pump Cost-Effectiveness.*

We have not dealt with geothermal heat pumps, except for the specifications, in about five years, Eckman said. Using the overhead projector, Eckman touched on the following major topics:

- Why now? Revised federal air source heat pump standards, reduced incremental cost and savings from upgrades, etc.
- Geothermal heat pump cost: sample of OTEC program participants (about \$15,000 total system cost on average) – table
- Geothermal heat pump cost: from Mark Jerome, Pacific Air Comfort (table) -- \$14,700 incremental cost)
- Impact of GSHP of recommendation on cost effectiveness of GSHP – reduces the number of cost effective GSHP applications by 94%.
- Issue: should the RTF establish “niche” application screen to preserve GSHP measure as an option where it is likely to be cost effective?

Even if this was dropped as a deemed measure, it could still be done on a site-specific basis, Bruce Cody observed. The group discussed base-case load, and COP. Eckman observed that, other than the custom installation proposal, he doesn't see a lot of light at the end of this particular tunnel.

Mark Johnson said he would like to revisit the cost of Energy Star heat pumps in general. Eckman said that, based on the analysis he has done so far, most Energy Star heat pumps will still be cost effective – they just won't be as cost effective as they were before. Perhaps we'll want to look at turning our specs into some sort of a commissioning approach, Adam Hadley suggested.

After a few minutes of further discussion, Keating moved that the RTF remove ground source heat pumps as a cost-effective measure. This motion was seconded and unanimously approved.

I assume this does not preclude this from coming in as a custom measure? Rosolie asked. Correct – it would not, Eckman replied.

9. *Next RTF Meeting Date.*

The next meeting of the Regional Technical Forum was set for July 17.
 Meeting summary prepared by Jeff Kuechle, NWPPCC contractor.

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 May 22, 2007

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