

Regional Technical Forum Meeting Notes

July 17, 2007

DRAFT

1. *Greetings and Introductions.*

Charlie Grist welcomed everyone to today's Regional Technical Forum meeting, held July 17 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 RTF's June meeting were approved with a few minor comments.

Ken Keating announced that Shel Feldman, one of the true pioneers of market transformation and a very innovative evaluator, died this morning after a short illness. The group expressed its sympathy for Mr. Feldman's family.

Tom Eckman asked the group for a decision on five staff authorization requests for spending money, and also presented a current accounts tally, so that the group knew how much money the RTF has left to spend. These are statement of work descriptions, budget statements, and one technical support contract, Eckman explained. He provided an overview of these authorization requests. After a brief discussion, Harris moved that the RTF approve the first three authorization requests; this motion was unanimously approved. The fourth request is to finish the interface between SEEM and Excel so we can put it into the new homes calculator and other things, said Eckman; we have someone standing in the wings ready to do this because I don't have time. This request was also unanimously approved by the RTF. Last, said Grist, I would like to set up a task order arrangement with Brian Thornton of Thornton Energy Consulting, a very capable EQuest modeler with a lot of experience in new buildings and LEED. I would like to use Brian as a sort of adjunct staffer and am requesting that we set up a task order of up to \$40,000 against his hourly rate of \$100, Grist said. This request was also unanimously approved. That leaves about \$110,000 in the RTF budget to last through the end of the calendar year, Eckman said.

2. *Updates.*

- a. **Hotel/Motel Room Lighting Sensor Cost Effectiveness.** Grist said this idea came from the Energy Trust, who would like to include this type of measure in its hotel/motel package. The units consist of wall-mounted switches that turn off the bathroom lights when no one is there but leave a night light on for customer convenience. In April, the RTF approved this measure pending cost effectiveness analysis. In May we reviewed that analysis and had a couple of issues, said Grist. One was, what if these bathroom lights are CFLs, not incandescent – does this measure still make sense? Today we're going to review round 2 of the cost effectiveness analysis, he said. The hours of operation are based on a peer analysis that showed that these sensors reduce average daily run time from 4.4 to 2.2 hours per day. We got the shape of the savings from that study as well.

Last time, we used 2006 costs, Grist continued. We have subsequently reexamined and revised those costs based on year-2000 dollars; the cost is \$59 for a retrofit and \$21 for a new installation. We're also counting lamp replacement savings, he said.

This time I looked at several lighting replacements in the CFL category, said Grist. The peer study showed about 180 connected watts of incandescent in the average hotel bathroom. That's about 2,400 lumens of output. Assuming similar lumen efficacy, the results were basically that putting the switch in, in a new or remodel situation, is cost effective in most of the four CFL cases studied, with B/C ratios ranging from 1.6 to 0.93. We saw savings between 33 and 48 kWh per bathroom. It wasn't cost-effective for any of the retrofit situations unless you have about 120 watts of connected lighting load that you can turn off, due to the high cost of retrofits, said Grist.

Grist reviewed the spreadsheet generated by and the assumptions underlying this analysis; the group offered a few clarifying questions and comments. Keating observed that the RTF doesn't generally set incentive levels – it's more an awareness. It could be self-limiting if incentive levels were set at the remodel level, Keating said.

The bottom line, said Grist, is that it looks as though these are cost effective in most cases. What we really need is an estimate of connected watts in new and remodeled buildings, and specifications for how this thing would be put together – what savings should we credit, for example? The savings we looked at had 47, 41 and 32 kWh in savings; something in the low 40s is probably reasonable, from a programmatic standpoint, for a switch that's going to be installed in a bunch of bathrooms. The gold standard would be if we could get a survey of the connected wattage in new and remodeled hotel bathrooms, Grist said – that way we would have an idea of what we were turning off and could use that as a basis for a programmatic savings estimate. David Baylon noted that there are four or five new hotels in new commercial construction; he said he may have audit data

on at least one of those hotels soon. He asked Grist to send him a reminder, and said he will bring whatever data he can find to the next RTF meeting. Grist asked Greg and Jill to develop specifications for this measure prior to the next RTF meeting.

Ultimately, no RTF recommendation was made on this agenda item.

- b. CFL Persistence in Walk-In Coolers.** At our last meeting, Ken Keating observed that, based on some of the California evaluations, it looks as though many of the CFLs installed in walk-in coolers were not operating – about 38 percent of them, said Grist. The folks at PECL reviewed the study, and said it wasn't clear why the CFLs weren't there – they could be broken, they might have been removed or never installed. Steve Cofer was going to check with his lighting suppliers to see if there are any better specs for CFLs in walk-in coolers, but he hasn't gotten back to me yet, Grist said -- basically, we're just keeping an eye on this, at this point.

Baylon noted that the delay between when the switch is triggered and when a CFL bulb lights up may be to blame – even if it's just 30 seconds, that might be too long to wait in a restaurant setting, he said. There are cold-cathode CFLs that are instant-on, Grist replied. Again, I don't know that there's anything we can do at this point, but we're keeping an eye on it, said Grist.

- c. Vending Machine Research.** You will recall that we hired Quantec to do a market characterization in the Northwest, because we believe there may be some savings associated with going to Tier II Energy Star vending machines, said Grist. We put together a subcommittee to investigate this issue; they have reviewed the draft report and we should be getting a final report soon. It has some very interesting findings on the population of vending machines, including the fact that it looks as though all of the new machines are going to be Tier II machines anyway, so we probably don't need to concentrate too heavily on new machines, said Grist. However, there is a huge population of machines that were installed in 1998-2000 as part of a closeout/inventory dump. In other words, there are a lot of old machines out there, some of which may be retrofittable to Tier II. Alternately, we may want to consider a program to get those off the market by encouraging their replacement, said Grist. Almost half of the machines in the region fall into that 1998-2000 vintage, he added.

What's the life-cycle of these machines? One participant asked. We'll have an estimate of that in the final report, grist replied, but what they're finding is that service life is less a function of machine age and more a function of where it is installed – outdoor machines experience a harsher environment. The bottom line is that it's a more complex situation than we thought, and I'm very happy we did

this market characterization study, Grist said, adding that the final report, and the subcommittee's programmatic recommendations, should be available prior to the next scheduled RTF meeting.

2. *Tacoma Power Condominium Mini-Split Heat Pump Monitoring Project.*

Rich Arneson said Tacoma Power had been approached by a developer, originally to understand what the energy efficiency options were for a five-story condominium building. That blossomed into that developer being willing to consider a mini-split heat pump system for the mixed-use development's 24 units. They have broken ground, and we have a short time-frame – maybe a couple of weeks – to get a program in place to evaluate and monitor the mini-split systems, Arneson said. What we're looking for, from the RTF, is additional funding to help us monitor that system properly, to make the results of that project useful for the rest of the region.

The cost of the sub-metering was estimated at about \$30,000 (for partial sampling). A more extensive program was estimated at \$50,000. Eckman said that, historically, the RTF has developed the scopes of work for programs like this one, but has not paid for the actual in-field work – our budget isn't robust enough to pay for field work. Typically we develop a scope of work that is then put out for bid; the work is paid for by other interested parties who want to purchase a piece of the action. We have just approved a budget to have Ecotope develop an RTF-approved protocol for mini-split heat pump monitoring – what to collect and how to collect it, Eckman added. That should be available by September, said Baylon. That is likely too late, said Arneson.

After a brief discussion, there was general agreement that, if Tacoma Power wants to get this metering project in place in the time-frame available, they will need to do it themselves. If possible, however, I would like to ensure that whatever protocol they use is consistent with ours, so that we can combine the data, said Eckman.

3. *Presentation, Discussion and Potential Decisions on Deemed Savings and Cost Effectiveness for a "Green Motors Management" Program.*

We had a presentation on this topic at the last RTF meeting, and a number of issues were raised, Grist said. We asked the presenters to do some more homework, which has now been done, he said. There were a number of action items from last time, said Jeff Harris; many of them related to program issues, documentation of results, quality assurance. The major outstanding issue is whether or not this measure is cost effective.

Dennis provided a presentation titled “Quality Motor Rewinding and Energy Efficiency Measure.” He touched on the following major topics:

- Deemed savings revision: deduct 1% efficiency for motors 40 hp or less; deduct 0.50% efficiency for 50 hp or larger motors.
- Deemed savings Table 1 (table) – revised Tables 2, 3 and 4 reflect similar results.
- Incremental cost revision addition – rewinding to a higher degree takes additional equipment and instrumentation, ongoing supervisor and technician training etc.
- Incremental costs table addition (table)
- Deemed savings by industry graph)
- GMPG specification addition
- Revised sample initiative application
- Total cost of ownership
- Program development – replacing standard with NEMA Premium (eliminating the bad dogs from the fleet). Other considerations: co-op and/or investor-owned utilities, with and/or without incentives, I-5 corridor and/or east of the Cascades.

The database will be cumulative and regionwide? One participant asked. Yes, Dennis replied – especially when we look at kWh savings by industry, in gathering that database we should be able to get a lot more detailed information on hours of operation and particular motors – each service center will be reporting their database monthly. Will you be collecting any data on hours of operation? Grist asked. Yes, was the reply. Grist observed that the Northwest Energy Efficiency Alliance’s work with industry in developing these specs is a very important piece of work, one that really breaks some new ground. I think the market effects will be that way, Dennis replied. Actually, this is a pretty big deal, said Harris – to get ESA to agree to a specification they would put their stamp of approval on, to say that, if motors are rewound to these specifications, they will perform at this level – this is the first time they have actually agreed as a group to standardize around that.

As we’ve seen before, a specification is a specification, but it’s the workmanship where the rubber really meets the road, said one participant – that’s the important thing that really determines whether your specification is going to be met. On page 20 of the proposal is a sample of the motor service center auditor form that describes what questions will be asked and what kinds of things the auditor will look for, Harris said.

Harris then provided a presentation titled “Green Motors Cost Effectiveness.” The intent here is to develop a deemed calculator to allow utilities to do motor-by-motor calculations if desired, or use a default setting based on horsepower. I didn’t complete the homework I was given last time, which was to revise the

calculator, Harris said, but I did create some default numbers to give you an idea of what the cost effectiveness looks like.

Harris then went through his presentation, touching on the following major points:

- Key assumptions: preliminary numbers only; basic equations to be implemented in revised deemed savings calculator tool; used new version of Procost v2.43 – includes 10 mills/kWh for risk mitigation credit for “lost-op,” 10% regional act credit, 15-year program/measure life, 4% real discount rate, Fifth Power Plan Mid-C marginal costs.
- Deemed savings equations (table) showing motor size vs. savings over standard rewind (1% for motors less than 25 HP up to 0.50% for motors larger than 75 HP); average motor load factor of 68.2%.
- Deemed costs (table) – motor size, incremental cost factor, incremental cost, for motors from 7.5 HP up to 500 HP.
- Deemed hours of operation (table): motor size and hours for motors of 1 HP up to 1,000+ HP. Values range from 2,745 hours to 7,436 hours.
- Preliminary Procost results (extensive table): measure, measure life, site savings, capital cost, total regional B/C ratio, supply curve TRC levelized cost.

Only one case isn't cost-effective in this analysis, said Harris – the first row, which is 7.5 HP motors. That's pretty intuitive; there is a fixed cost to rewind a motor, and the smaller the motor, the lower the savings. I also did an alternate analysis, he said, making the price deflator adjustment of about 15% from 2007 to 2000 dollars, and lowering the load factor from 68% to 60%. I did a revised measure life based on a fixed motor life of run time, rather than years in existence, Harris said. I took a guess and said that, for smaller motors, which tend to be less heavy-duty, at a load factor of 60%, the fixed motor life run time would be 30,000 hours. For big motors, the number was 50,000 hours. These numbers may need to be re-run, but they give you some idea, Harris said. If you combine that with the average operating hours for the different motor categories, you end up with lifetimes that range from 10.9 years for the tiny motors to about 7 years for the big motors. We're essentially shortening the life based on rated hours of total operation for each motor, as opposed to just picking a 15-year measure life, as we did last time, Harris said. The bottom line is that, when you do this, once again, only the smallest motor fails to pass muster in terms of cost effectiveness, he said.

Is it really motor life, or the life of the rewind, that this analysis is intended to look at? one participant asked. For all intents and purposes, they should be the same, Dennis replied.

The takeaway message is, this program will be cost effective at least for any motor 15 HP or larger, under almost any circumstances you care to throw at it, Harris said. The program is going to be cost effective under a broad range of scenarios; we will put this in the form of a deemed calculator so people can crunch their own numbers. I would suggest that we place a cutoff line at 15 HP and say that anything above that is included in the deemed numbers for an average motor case, said Harris; of course, anyone who wants to can put an individual motor into the deemed calculator as well.

The key factors for RTF consideration today are the deemed savings table showing savings over standard rewind, and the incremental cost numbers, by motor category, in 2000 dollars, said Harris. The third piece would be the specifications document that's embedded in the application – those are the three things we're asking the RTF to approve.

After a few minutes of discussion, Harris moved that the RTF adopt the cost savings, program specifications and quality assurance components of the Green Motors Program, with the understanding that this applies only to motors 15 HP and above. Jim Williams seconded the motion; it was unanimously approved.

Next steps will be to revise the deemed calculator tool, said Grist. However, if we use the cost and savings equations you just saw, there is no need to bring this back to the RTF, Harris said.

4. *Presentation, Discussion and Decisions on Proposed Prospective Program for New Commercial Construction and Review of CEE Tier II Cost Data for Premium Efficiency HVAC Equipment.*

Our overall goal here is to develop some prescriptive programs for selected simple commercial new construction projects, where you wouldn't have to do a lot of modeling and independent analysis of measures and savings, Grist said. We would like to do this from a whole-building perspective if we can, with integrated measures where possible; we would like either deemed or deemed calculated savings, some commonality across the region if possible, and training for designers, builders and developers, Grist said.

Progress to date has been slow, he continued; we have a commercial new construction (CNC) strategy group, mostly utility folks. Six meetings have taken place across the region to identify needs and opportunities. We have a small RTF subcommittee looking into the specifics of this, which has spent the last couple of months looking at small offices as a starting-point. The New Buildings Institute has done some useful work in this area, said Grist; we have also done some additional cost effectiveness work.

Grist provided a presentation, touching on the following major topics:

- The RTF subcommittee reviewed 21 potential measures, 8 in detail; they used the Oregon code base with two climates (Boise and Portland); they considered four HVAC system types.
- There have been several iterations on both baseline conditions and measures
- Detailed analysis on 8 measures – glass, lighting power density, occupancy sensor lighting in open office, fan power improvement, rooftop economizer Cx, premium HVAC equipment.
- Summary of results to date: most measures look to be TRC cost effective except CEE Tier 2 premium HVAC equipment, fan power in the VAV system, rooftop CX in the PSZ systems, T5HO lighting option. Most kWh savings provided by HPT8 lighting. Windows were the second-biggest electric measure and the biggest gas measure. HVAC measures provided about 1/5 of the lighting and window savings.
- More results to date: climate makes little difference in the kWh savings estimates, except for windows in the HP systems; climate makes a very modest difference in gas savings for the U35 window measure; HVAC system type has a bigger impact on kWh and therm savings.
- kWh savings, by measure (graph)
- Therm savings by measure (graph)
- Cost by measure (graph)
- TRC B/C ratio, by measure (graph)
- Climate impact on windows (kWh) – graph
- Climate impact on windows (therms) – graph
- CEE Tier 2 equipment (graph)
- Measures combined to packages – B/C ratios are between 1.0 and 2.0 for most packages; high B/C ratios compensate for low; but there are not enough savings to cover all the low B/C ratios, either for CEE Tier 2 or T5HO lighting option.
- Issues: CEE Tier 2 HVAC equipment – cost uncertainty and low B/C ratio, will costs come down; packages; is baseline really code? What is standard practice? – window U value and SHGC, LPD; other measures; other state baselines.

Grist offered the following recommendations:

- Plenty of cost effective savings to proceed
- Start program design work
- Package measures into appropriate bundles
- Develop specifications for measures
- Analyze other state baselines
- Analyze other climates
- Design evaluation

The group devoted a few minutes of discussion to Grist's presentation, offering a few clarifying questions and comments. Baylon observed that, in his view, this analysis makes the case for a two-measure program: windows and lighting systems. It isn't that there's nothing you can do in HVAC, but it's hard, Baylon said – there are significant issues associated with HVAC training, and there are a lot of uncertainties about the HVAC savings.

The real question, though, is, should we be shooting for a package of measures here, said Harris – it isn't necessarily, should it just be two measures. The discussion turned to commissioning; Baylon observed that most of the commissioning numbers that have been used for the last decade have no real justification. What we do have is some pretty good, but not very well-justified, simulation results, he said. We have done a fair amount of work on larger buildings, but for this kind of building, it's true we don't have a lot of commissioning data, said Harris.

The group discussed the importance of control strategies in VAV systems. Keating revisited Baylon's point that packages are a good idea, but shouldn't necessarily include a prescription that they have to include CEE Tier 2 HVAC systems. The point of this exercise is to develop a simple method of qualifying buildings, of providing incentives across the whole region in such a way that small utilities can run the programs, Keating said. The extra training, specification writing and other complications Tier 2 HVAC introduces defeat the purpose of having a simple measure, he said. The window and lighting system measures work, they're cost effective, and it doesn't take a rocket scientist to get them right, Keating said. There was general agreement with Keating's point.

After a few minutes of additional discussion [NOTE: the outcome of this item was cut off by the transition between the tapes]

5. *Presentation and Discussion of Revisions to ProCost Cost Effectiveness Analysis Model.*

You will recall that ProCost is the program cost estimating model invented by Jeff Harris in 1991, said Grist. The Council has used ProCost for many years to do cost effectiveness analysis in support of its Power Plans. The RTF uses it to evaluate TRC cost effectiveness of various measures and programs. Three years ago I was asked to revise the ProCost model to give it some additional capabilities, Grist said; that work is now done.

Grist then provided an overview of the changes to the ProCost model, touching on the following major points:

- What ProCost is, what it does
- Life-cycle cost analysis, takes multiple sponsor points of view

- 85 output metrics; also generates supply curves
- Inputs: measure costs and savings, when savings occur, the load factor of the savings, coincidence of the savings with peak transmission/distribution system times, avoided costs of power or gas, the financial parameters of the sponsors of the measure, discount rate and various program measures.
- Outputs include life-cycle cost and benefits, by measure, sponsor point of view, supply curves with shaped savings.
- Methodology
- What ProCost does (demonstration)

Grist then moved on to what's new in ProCost Version 2.2:

- Uses the time-based value of savings concept used for electricity in the previous version on natural gas savings
- Added the capability to generate credits by estimating time-based savings for CO2 offset
- Added more perspectives (both sponsor and societal)
- Added more output metrics
- Supply curves are now reported with the shape of the savings
- Added more input parameter choices
- Added a feature to calculate the risk mitigation value of conservation
- B/C ratio calculation method revised to handle negative benefits and costs
- Structured the model so it will work for natural gas utilities, reporting savings in terms of therms as well as kWh.

So that's what we're doing, said Grist – we're now testing build 2.53, and we're still finding a few bugs. We are looking for interested testers to exercise the model, because that's really the only tool I have for effective debugging. If any of you are interested, you can download it from the Council's drop box, he said, adding that new avoided cost streams will be added as model development progresses.

Are non-energy benefits included? Bruce Cody asked. Only the ones we can quantify and monetize, and that you guys sign off on, Eckman replied. In doing your own B/C ratios, you'll have a lot more flexibility than we might have, said Baylon. True, but if push comes to shove and you need to document what you put in, some evidence would be nice, said Eckman.

The bottom line is that, by design, the model now has a tremendous amount of user flexibility, Grist said. He noted that, among its other outputs, the model specifies the time and date of the run as well as all of the input parameters used. Grist provided a brief overview of other model outputs. All of that is new, he said, and hopefully it will help us as the RTF moves forward.

6. Presentation and Discussion of Proposed Research on Insulation “Grading” in Energy Star New Homes.

[NOTE: tape 4, which contained the discussion of this agenda item, was blank – can you stick in a brief summary of the outcome?]

Brady Peeks led this presentation, titled “Residential New Construction – Insulation Grading Baseline Survey. Among the highlights:

- Where insulation happens (photos of houses under construction and the areas where insulation is used).
- Grade III: shall be used to describe an installation with substantial gaps and voids, with missing insulation amounting to greater than 2% of the area, but less than 5% of the area it is intended to occupy.
- Grade II shall be used to describe an installation with moderate to frequent installation defects: gaps around wiring, electrical outlets, plumbing and other intrusions; rounded edges or “shoulders;” or incomplete fill amounting to 10% or more of the area, with less than 70% of the intended thickness.
- Grade I shall be used to describe an installation that is generally installed according to manufacturer’s instructions and/or industry standards. A Grade I installation requires that the insulation material uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids.
- California Residential Construction Quality Assessment Project – Phase I final report: accounting of wall insulation defects by site (graph)
- California Residential Construction Quality Assessment Project – Phase I final report: wall defects observed with IR camera

Peeks offered the following proposal:

- Survey homes in the Northwest: 30 each in Oregon and Washington, 15 in Idaho, 10 in Montana
- In all cases, no more than 3 homes shall come from the same subdivision
- Use all non-Energy Star homes to avoid homes influenced by program efforts
- Ecotope to take survey data and ascertain baseline thermal performance for building assemblies, especially walls
- Determine thermal performance improvement expected from additional training/inspection or alternate insulation systems.

7. *Presentation, Discussion and Decision on Revised PTCS Heat Pump and Central Air Conditioner Sizing Calculator.*

Eckman demonstrated his revised PTCS heat pump and central air conditioner sizing calculator using the overhead projector. He noted that the idea is that users will now be able to put this into the PTCS, in lieu of using the manual J in the specs, for sizing, where applicable.

The group offered a few clarifying questions and comments, identifying one error in the calculator, which Eckman fixed. Ultimately, it was moved that the RTF approve Eckman's revised PTCS heat pump and central air conditioner sizing calculator, as corrected at today's meeting. This motion was seconded and unanimously approved.

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

Eckman said he had not received the data he needed in time for today's meeting, so this agenda item was deferred to the RTF's August meeting.

9. *Presentation, Discussion and Potential Decisions on Revised Energy Star Fixture Savings and Cost Effectiveness Analysis.*

The purpose of this revision is to update the fixture-by-fixture savings for CFL fixtures, Eckman said. There are a limited number of those going out the door, but they are being paid either \$2.50 or \$4 per socket. I discovered that the way I had done the analysis was to credit the savings on a per-room basis instead of a per-fixture basis, Eckman said; the payments are calculated on a per-fixture basis. I then went back and divided by the right number so that the savings went down per unit, though in total they're still the same, and match what we're actually paying for, he explained.

In so doing, I also pulled together estimated hours of metered use per room from the four studies we have, Eckman said. He provided a brief overview of these studies and the results of his analysis, describing the basis for what has changed.

I was looking at this the other day, and in living rooms, for instance, you showed 110 at the bus bar for a living room fixture, 63 per lamp, said Keating. It sounds as though you're saying that the fixtures were averaging just under two bulbs per socket. That's correct, Eckman said – if you're paying on the basis of \$2.50 per socket, if we do the math consistently, you get the same savings per socket, whether it's a lamp or a fixture.

I'm wondering if we don't have an opportunity to reduce the number of measures, said one participant – I only know of one utility that reported by room in the last

CRC, and it is very confusing to go through that long list to find the one you want to use, since it's all paid at \$2.50 per socket. There is an "any fixture, any room" function, Eckman said. I know, but I would like to see anything that doesn't get used on a regular basis taken out, the participant suggested. I keep hearing that, but I also keep hearing from utilities, "I want to report that," Eckman replied. They ask for a lot of things, and they frequently don't use them, the participant said.

10. *Other.*

- a. ***PTCS Training.*** Bob Lorenzen said that, recently, Bruce Manclark convened a meeting to discuss some of the issues surrounding the training of HVAC technicians on some of the issues surrounding heat pump installation and repair and duct sealing. The number of currently-trained technicians is fairly large, but there are a lot more who could be trained. The existing resources that Bonneville and others have to pay for this are limited.

There could be other ways of doing this, including HVAC shops with training programs already in place, utility companies that could provide training, and community colleges and trade schools, Lorenzen said. We came up with a couple of ideas at the meeting, he continued. At the HVAC shop level, we could create a master technician category; this person could become "anointed" to convey the rules and testing procedures to apprentices in the shop. At some point, those folks could then take the exam, potentially on-line. There would also need to be a field demo component for an approved training provider, he said.

We discussed how many jobs this person would need to sign off on, said Lorenzen; 30 approved jobs through PTCS, plus three jobs that have been third-party QA-approved, seemed to be the numbers we arrived at. We mainly talked about ducts, he added – we didn't really come to a decision regarding the flow plate component of the heat pump installation program. We thought this might be a way to encourage and reward the larger and more motivated shops that are involved in PTCS, Lorenzen said, to speed up the process and work within the existing training structure.

Within the rules we've set up, there is a way to become a training provider if you meet the experience requirements, Lorenzen said. This pathway has been written down, but there aren't a lot of people who have taken advantage of it. These people can do the training, but they can't do the QA part, he explained. Also, at the community college level there may be a couple of people who fit pretty well within this category, and could provide this training if they so chose. Basically the idea is to expand the definition of who can do training, while preserving the requirement that authorized PTCS providers have the responsibility for QA and oversight of those certified as technicians, added another participant.

In terms of next steps, said Lorenzen, the plan is to write this up more formally and distribute it in advance of the next RTF meeting. We'll then get RTF feedback at the meeting. We'll be back, he said.

11. *Next RTF Meeting Date.*

The next Regional Technical Forum meeting was set for August 28. Meeting summary prepared by Jeff Kuechle, NWPPCC contractor.

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