BEFORE THE

UNITED STATES DEPARTMENT OF ENERGY

PUBLIC MEETING ON

TEST PROCEDURES FOR RESIDENTIAL

CENTRAL AIR CONDITIONERS AND HEAT PUMPS

TRANSCRIPT OF PROCEEDINGS

11 June 2010

Washington, D.C. USA

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I N D E X

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TEST PROCEDURES FOR RESIDENTIAL

CENTRAL AIR CONDITIONERS AND HEAT PUMPS

TRANSCRIPT OF PROCEEDINGS

Public Meeting was held pursuant to Notice at the Conference Room 8E-089, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, D.C., 20585, USA, commencing on the 11th day of June, 2010, at 9:00 a.m. ET.

MR. BROOKMAN: Good morning, everyone, and welcome. This is U. S. Department of Energy Public Meeting on Test Procedures for Residential Central Air Conditioners and Heat Pumps.

We're going to start off this morning with welcoming remarks from Rich Karney.

MR. KARNEY: Thank you, Doug.

I know some of you. Some of you are new acquaintances.

My name's Richard Karney. I'm with the U.S. Department of Energy's Building Technologies Program.

Those of you who know me in the past, I used to run the ENERGY STAR Department for the Department with the portions of the products we managed. We no longer manage any products for ENERGY STAR, so my duties have shifted to being in charge of verification tests and, for ENERGY STAR, and with the additional duties of also leading up the Test Procedure Team out of the Regulatory Branch of the Buildings Technology Program.

And I'm here to welcome you. I've gone through the presentation.

Looks like it will be a very interesting discussion this morning. And one thing I would just like to, to put out is that the Consent Decree will, will not be discussed today.

That's not part of the Agenda. We are to be concentrating on the test procedure itself.

So, with that, I'd like to introduce Wes Anderson, our Technical Manager for the Test Procedures For Central Air Conditioning and Heat Pumps.

MR. ANDERSON: Doug, if you want to go ahead and start?

MR. BROOKMAN: Great.

I know Wes has some substantive presentation, so we'll do the introductions first. It's our tradition to provide each person an opportunity to just introduce him- or herself.

Everyone, please state your name and affiliation. I'll go around the room.

Those of you sitting at the table, this will, will be recorded. And the little green LED light's got to be on.

But, everybody else, we know you're here. You registered, so there will be a record of your presence here.

Name and organization.

(Whereupon, self-introductions were made as are reflected on the Attendees Page, after which the following occurred:)

MR. BROOKMAN: Thanks for, everyone, for being here, giving us an opportunity to start on time. Well, I'm going to do a very brief agenda review, and you can, you can -- I think all of you received a packet as you registered downstairs at the Registration Desk.

In the packet is not only an Agenda, but the PowerPoint slides which will be the focus of both the presentation and an opportunity for discussion and comment as the day goes on.

Immediately following this agenda review there is an opportunity for anyone that wishes to do so to make brief summary remarks, brief opening remarks about the issues that may be of concern to you and your interests.

Following that we're going to have some test procedure history from Wes, and then going straight on to scope of test procedure revisions, and then proposed revisions, the first set, as listed in the Agenda.

We'll take a break midmorning, around about 11:00 or so, and then the proposed second set of revisions after the midmorning break. And then following that, rulemaking schedule and impact on manufacturers, and a summary and description of next steps.

There is another opportunity at the end of the day for anybody to raise any additional issues they don't think have been covered

sufficiently. So, that's the way we'll do it.

The way the Agenda reads, we intend to be, to be out of here at 12:30. We'll see how well that works.

Try our best to stay on time and, and be efficient in the use of our time.

Questions and comments about the Agenda?

(Whereupon, no response was had.)

MR. BROOKMAN: I'd ask your consideration, what has emerged as, I think, common courtesy in these meetings. Please speak one at a time.

Please say your name for the Reporter. You don't need to say your organization, affiliation each time; your name will be sufficient.

We'll -- There will be a complete Transcript of this meeting available and posted on the web site. More information on that later.

I'm going to be calling people as best I can by name to speak. Also, wish to encourage follow-on comments.

Sometimes that's very useful for the

Department to hear the, the ebb and flow. And please keep the focus here.

If you'd turn your cell phones on "silent" mode and limit the sidebar conversations, that will be helpful. And if you could, please be concise.

Share the air time. There's a lot to be said in this short span of time today.

Questions and comments before we proceed?

(Whereupon, no response was had.)

MR. BROOKMAN: Great. Let's have -- Let's have opening remarks, issues that people wish to raise here at the outset.

(Whereupon, no response was had.)

MR. BROOKMAN: No opening remarks? Is everybody bored?

Okay, Harvey.

DR. SACHS: Okay. I want to welcome Jim Crawford back to the group.

MR. BROOKMAN: Thank you.

MR. CRAWFORD: I won't rebut that. I feel glad to be here.

MR. BROOKMAN: Okay. So, then let's proceed.

Wes Anderson.

MR. ANDERSON: Morning again. My name is Wes Anderson, and just some housekeeping points I want to go over.

All correspondence should have these three bulleted items in it so it can make sure we get to see it: The regulatory identification, Energy Conservation Test Procedure for Residential Central Air Conditioners and Heat Pumps; the Docket Number, EERE-2009-BT-TP-0004; and title, Regulatory Identification Number, or RIN, 1904-AB94.

You can submit your comments also by using the Federal Rulemaking Portal at http://www.regulations.gov, or e-mail to the e-mail address posted here, and post mailed through the Mail Stop EE-2J. Or, for human courier, to 950 L'Enfant Plaza.

Please note that the comment period closes August sixteenth, 2010. And this is the reiteration of what Rich said earlier.

DOE is aware and, and evaluating the

Consensus Agreement. DOE is also aware of the interested parties' desire to address issues related to the Agreement, and we will make our determination at a later time on that Agreement.

Therefore, please limit your comments and questions today to the issues related to the test procedure. You may submit further concerns related to the Agreement and other relevant issues in your written comments.

Okay, we did the, we did opening remarks. After the test -- Now for the test-procedure history.

The Final Rule for, was published in October, 2007, and the purpose for that Final Rule for the test procedure for central ACs, residential central ACs was to expand coverage such as the small-duct high-velocity, multi-split systems; to address minor updates; and to improve the complementary sections to, of the CFR for testing requirements and rating options.

No changes that affected the SEER and HSPF, and we've addressed some minimally compliant units.

Expectation was to, for the test procedure was to address all adequate, address adequately all foreseeable future issues.

Unfortunately, -- Well, not unfortunately, but fortunately, the EISA came out and, in December, which required us to address up to two regional standards, and to, on, on top of the national standard, and to account for a standby and off-mode energy consumption.

DOE concludes that a test procedure rulemaking is merited to assume, to assure compliance with EISA and to consider a few non-EISA test procedure updates.

So, we'll take an opportunity to address some of, additional concerns that came up after the publication in October.

Now it's time for Brian Dougherty, from NIST.

SCOPE OF TEST PROCEDURE REVISIONS

MR. DOUGHERTY: Thank you, Wes.

So, today we're going to look at the scope of the test procedure revisions in two sets, as was introduced earlier. The first set includes

the types of, of multi-splits.

We're also going to look into some issues tied to laboratory installation provisions; next, on the test tolerances and in-situ calibration in two areas.

First one, test tolerances with regard to the indoor air flow and with regard to the calibration that impacts the cyclic degradation. We also wish to address the two Waivers that came in from that Final Rule that was completed in October, 2007, one having to do with the application of uses of multiple indoor blower units; the second having to do with what is termed here a triple-capacity northern-climate heat pump.

Offer a few other additional miscellaneous items, and that will complete Set 1. And then after our break, we'll, we'll resume with Set 2.

And Set 2 will look at more of the EISA-generated issues, the first one having to do with addressing standby/off-mode measurement requirements, and the measurement of that reporting. Touch on how potentially should the

test procedure be affected by the need to complement the regional Standards, and then finally some related extras that come in part as, as, as a result of these actions, and also some admitted omissions that weren't in there that maybe we should yet try to grab.

PROPOSED REVISIONS SET Nbr. 1:

MR. DOUGHERTY: Okay, so let's just start with this Proposed Set Number 1. And they are partitioned in a way that this, this first set would be ones that would not affect the SDHV.

They could be introduced in the near term, would not require retests, and we could just move forward on them immediately.

The second set would be timed to occur to become the same as Standards, so it would be out into the future time, potentially 2016. And so it would be timed to occur then, and so that's why they're partitioned the way they are.

Okay, the first one, let's talk about multi-splits.

MR. DEPPEL: Thank you.

MR. DOUGHERTY: The first one has to do

with the definition of "Tested Combination." This occurs in the test procedure currently, and follows the publication in 2007.

Industry noted that there are several changes they would still like to see in that definition; three, in particular. Two were, in fact, proposed in this rulemaking.

The first had to do with the definition of "capacity" to clearly delineate that any recommendations to capacity mean the nominal value. In matching indoor to outdoor, they'll slightly broaden the indoor combinations that qualify.

Examples had to do with nominal values not measured, and they were associated with cooling performance, not heating.

So, there was an effort in there to be clear that in trying to evaluate whether or not your particular indoor combination meets the definition that's needed for testing, to show that, yes, we're talking about cooling; we're talking about nominal values.

MR. BROOKMAN: Slow down just a little bit. Just a little bit.

MR. DOUGHERTY: Okay. And any time someone wants to --

MR. BROOKMAN: Yeah. You're covering a lot of content here. I want it --

MR. DOUGHERTY: Okay. Sorry.

The second item had to do with the fact that when you test minimum external statics for multi-splits, there's a requirement there as to the matching of the outdoor unit's capacity to the cumulative capacity of the indoor unit.

And the, the criterion in there now was that you had to be within a certain bracket. And the thing that we failed to do with that bracket was to cover more specific, the more typical cases where it would end up with these whole numbers of 95 and 105 percent.

So, there's an effort there to clearly say that you can hit those and it's acceptable combination.

And there's also a stipulation, we realize, for smaller-tonnage units. There's cases where you may feel you didn't meet that bracket.

So, there's caveats that that can be

waived if, in fact, you cannot meet that because you don't have combinations that will allow you to do so.

The final item that was proposed but was not, was, we received feedback on but was not proposed in this NOPR was to address the case of commercial systems, specifically allowing more indoor units to be at the high end used to make up this match.

Because this test procedure is limited to residential, less than 65,000 BTUs per hour, the DOE has chosen not to address that in this rulemaking. We'll have to address that with some other mechanism, but not use this as a means for addressing commercial.

MR. BROOKMAN: Paul?

MR. DOPPEL: Paul Doppel, Mitsubishi.

One thing we've done with the HR&I 1230 Standard approved last year was to incorporate multi-split systems, no matter what size, into that 1230 Standard. So, we're -- It's kind of differentiating between HRI Standard 210, 240, to bring all the multi-splits into one.

And I notice that has not been addressed in this rulemaking, and just bring that up for consideration. We're going to put that in our comments, written comments later, but I just wanted to make sure that that was noted.

And the Engineering Committee from the Ductless Engineering Committee will be putting some comments forth on that, also.

DR. AMRANE: I have a question for, for Brian. Yes, I know it's to follow this, these proceedings for the commercial products, but we have not, as 90.1 has now a category for VRF and represents HRI 1230 as the test procedure.

And I guess I'd like to urge DOE to, to look at that and, and try to establish a better test procedure for VRA system for commercial for about 1,000 BTUs.

MR. BROOKMAN: Okay. Thank you.

Other comments at this point?

MR. DOUGHERTY: The next issue with regard to multi-split systems was the comment that they are ducted multi-split systems, although, although the majority tend to be nonducted.

But, in ducted systems, as it came out of the Final Rule, 2007, they would be subject to the same minimal external static requirements that are applied to conventionally ducted systems.

And the, the, the response there was that typically these duct systems would be much shorter in length, and often the systems wouldn't be rated anywhere near these minimum statics that would be applied to conventional systems.

So, the proposal that came forward was to allow them to be tested at the rated external static.

I'm going in the wrong direction. Get me back.

MR. ANDERSON: The "up" arrow.

MR. DOUGHERTY: Oh, shoot. Start this before.

MR. ANDERSON: Fifteen.

MR. DOUGHERTY: Fifteen? Thank you.

MR. ANDERSON: Fifteen.

MR. DOUGHERTY: Look here, just to make sure. Okay.

Sorry about that. Okay.

And as far as the, the proposal that's in the test procedure specific to multi-splits, ducted multi-splits is an additional question that came into the NOPR Preamble, is if it applied for multi-splits, should it be considered for other systems that potentially had a comparative?

And so the two that would come out of here are in the case of a ducted mini-split, and also potentially the furred-down ceiling-mounted units that you would see in a space where you have, the unit would tend to be, be in a joist space, and so constrained as far as its size, but nevertheless have a short duct to supply that indoor unit.

In the test procedure, what, the numbers that are recommended, let's start with what's in there now. What's in there now is a category for small-duct high-velocity that was imposed last rulemaking.

And as always, the ones for the others have been there since the start of the procedure. And the proposal here is, rather than to go with a rated value that the manufacturer specifies, let's do as we do with the conventional systems and

specify a hard number that you have to equal or exceed in order to constitute a valid testing, a valid setup.

And so the numbers there are ones that, in trying to proportion things, given the fact that the, the ducted systems are at these values, what may be a ducted system associated with that, and then compare that to the relative ratio:

Potentially, what will you see with the multi-split to come up with these hard numbers? So, these certainly are subject to change, but there's an effort here to have things treated in a similar fashion, but yet recognize the fact that these systems would have less ductwork to overcome, and so should be subject to lower minimals.

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs, AC-triple-E.

I think a number of us would greatly value an effort by the Department to give a justification for the existing values for, quote, "all other systems."

The empirical evidence from field studies of both new and existing systems is neither

credence to having ESPs staged by capacity, nor for values anywhere near this range. They tend to be substantially higher.

I think this is an important issue as you're getting into the revision of the test procedure, and look forward to the revision including a justification for these particular values.

MR. BROOKMAN: Okay.

Yes, Paul.

MR. DOPPEL: Paul Doppel, Mitsubishi.

I think the proposal that we sent forward for the ducted mini-splits was, did not intend to include all the ducted mini-splits in that lower category because there are, there are a certain number of systems that have that short-run capability, but there are other systems that have a little bit longer. So, --

MR. DOUGHERTY: So, the, the, the -- As I recall the comment, that was typically they would be between .02 and .1, and that will --

MR. DOPPEL: Yeah. Yeah, there are some, there are some ducted models that do not

produce a-tenth of external static pressure, so there was no way that they could be tested.

And that was more the intent of, of our comment, was more: Cover those special systems, special ducted systems, rather than, you know, all of the ducted multi-splits.

MR. DOUGHERTY: But, how do you differentiate "special"? Isn't there a potential there that everyone becomes special?

And then comes the rated values.

MR. DOPPEL: Well, it's within, it's within the manufacturer's capability. The way, the note we have that we put in the 1230, and also what's in the 1230 Standard, I think covers, covers that.

MR. DOUGHERTY: Okay.

MR. DOPPEL: We'll, we'll put some further comments in there, but we just didn't want to have -- I don't think we want to have the ducted portions of the multi-splits categorized in this in this way.

MR. BROOKMAN: Where are we in these categories? I'm confused.

MR. DOUGHERTY: They are subject to the red entries for external based on their nominal capacities.

MR. DOPPEL: But, most of the ducted indoors with the multi-split systems would comply with the "all other systems." And then there are just, there are some that would fall in this "Other" category.

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: Jim Crawford.

Just to make the observation that with traditional systems, the flip side of what Harvey Sachs pointed out is that there is a tremendous diversity on the downside in terms of ducting.

And we've all stayed in, in hotels, probably, that, that had the unit just above the entry. And some of those are one-on-one, simple, conventional systems with, you know, ducts that are 12 to 18 inches long.

So, there's -- For all these systems, there's a tremendous variety.

MR. DOUGHERTY: Thank you.

Okay. And throughout this presentation

I'll reference questions with these yellow boxes, and differentiate the two based on the fact that in some cases at the end, well, in the case of the, the first box up here, at the end of the, the, the, the, the Notice of Proposed Rulemaking that was published on June second, there were 11 questions that were put together at the very end of it.

And so some of those will be repeated here, but I'm, not in the same order that they appear in the written document.

And then there's a separate set that we, as we developed this presentation, we thought, well, maybe we'll have people who want to ask those as well. So, the first one actually appeared as the, the 3.

And it asked the question: Is a separate set of minimum external static pressures an acceptable way to address the testing of ducted multi-splits?

And that's setting a hard value for them, as opposed to doing some other method, particularly letting them be specified by the manufacturer and testing at the rated value be the

way to go forward with testing these products?

That was the, the first question there. And I think it sounds like we have kind of covered that to a certain degree already.

The second question was: Should we extend this coverage, whatever it might be, to other systems that have a short duct besides ducted multi-splits?

Should we apply it to, in the case of ducted mini-splits or the furred-down ceiling-mounted units Jim was mentioning?

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: Yeah, Jim Crawford.

I'm a little bit confused here in that when I look at the details that are on that page, they weren't the same as what I've got in front of me, and specifically, the first item you referred to as Issue Number 3, and on the hard copy is referred to as Issue Number 2.

And kind of wonder how many other differences there are.

MR. BROOKMAN: It's the same question, though.

MR. DOUGHERTY: Good point. And what happened here is there was an edit that occurred after the publication.

So, you're right.

MR. CRAWFORD: Where's Issue Number 2?

MR. DOUGHERTY: It's a little later. Unfortunately, there were two Number 2s.

MR. ANDERSON: This is Wes, at DOE. We made some changes at the last minute.

It takes about three or four days to get the publication, get the publication of these copies done, given our resources. Please bear with us.

When we find changes, we try to make it so that in the Public Meeting we address what we're trying to say. And so -- And the orders in the numbers for the NOPR issues are the numbers related to, as they were written in the Federal Register, but we chose to change the direction of the presentation.

It seemed more logical to address it that way, as we have it here. So, please don't get confused by the numbers.

Just focus on the questions. Thank you.

MR. CRAWFORD: Assuming our comments deal with this morning's efforts in one way or another, how do we refer to that issue? Is it Issue Number 2, or Issue Number 3?

MR. ANDERSON: This will drive the conversation, so it's, it's Issue Number 3, or Public Meeting Question Number 1.

MR. CRAWFORD: Then could I request that we have a corrected copy?

MR. ANDERSON: You'll have a corrected copy once it will go up on the web page. We'll put this presentation up on the web page after the public meeting.

MR. BROOKMAN: We'll try and have it so our presenters call out the changes.

Paul?

MR. DOPPEL: Yeah. I just wanted to, to read out the statement that we had in this 1230 procedure for these, the, the mini-splits.

If the manufacturers' rated external static pressure is less than 0.1 inches water, then the indoor unit should be tested at that rate at

external static pressure.

MR. DOUGHERTY: And I guess my concern is: What would stop a manufacturer from saying their rated value is always less than that value? So, that's the concern.

MR. BROOKMAN: Paul, you've got a, you've got a way to address that?

MR. DOPPEL: We were essentially relying on the honesty and integrity of, of manufacturers in order to do that, but it, that could be easily said of the manufacturers in, in any, any of these tests.

You know, manufacturer could provide any kind of documentation to alter what was presented in order to try to get around some of these test procedures. But, in these cases the intent is that these systems just do not have the cap- -- They, there's no way they can run at .1 static pressure.

MR. BROOKMAN: Karim?

DR. AMRANE: I think I understand your concern, Brian, and so that's the comments.

MR. BROOKMAN: Okay. Harvey, you want in here? No?

DR. SACHS: Okay. I'm too confused.

MR. BROOKMAN: I'm glad I'm not the only one.

DR. SACHS: Sorry. Harvey Sachs.

I'd like a clarification. In our comments, rather than writing out each of the questions, are, is the request, Wes, that we use this numbering, the numbering in our handouts, or some other numbering?

MR. ANDERSON: The numbering in this presentation matches the numbering in the Federal Register Notice, --

DR. SACHS: Okay.

MR. ANDERSON: -- so use the presentation for, the Federal Register for the NOPR issues.

MR. BROOKMAN: The stuff that's on the screen, that's, --

MR. DOUGHERTY: Correct.

MR. BROOKMAN: -- that's the form --

MR. ANDERSON: That's the, the form; correct.

MR. BROOKMAN: -- that you wish, that he

wishes for you to follow in your comments.

Molly?

MS. TROMBLEY-McCANN: I just wanted to check in with the gentleman from Mitsubishi.

So, for this special subsection of multi-splits that can't meet the Standard, are the proposed levels something that they could meet?

MR. DOPPEL: Yeah. Those, those shouldn't be a problem.

MS. TROMBLEY-McCANN: Okay. So, it's just a question of which multi-splits are assigned to those levels.

MR. DOPPEL: (Nodded yes.)

DR. SACHS: Number 3 is just a number.

MR. BROOKMAN: Did we address both the questions?

MR. DOUGHERTY: Yeah.

Just to review, then, Question 1, that was not in the published document. It was a question whether or not we should apply, if, in fact, whatever comes forward to cover ducted multi-splits, should that be applied to ducted mini-splits and also the furred-down

ceiling-mounted systems that we were talking about.

And the asterisk there is just to try to -- The key thing here is always to try to define this category so it's fairly well-defined, and not something that can be potentially abused. And so the definition here is to say that indoor units that would fall in this furred-down category would be ones that were no more than 11 inches high, tall, no more than 24 inches deep.

So, it's meant to fit between the joist space. And the single-split application, as far as the coil perpendicular to the flow stream and the rated capacity for the system doesn't exceed 39,000.

Now, maybe there is a split core, but I haven't seen it. And also, a capacity of 39,000.

MR. DOPPEL: All of our coils would be splits.

DR. SACHS: For furred-down?

MR. DOPPEL: For all the --

MR. DOUGHERTY: For multi-splits, that's a different category.

DR. SACHS: Different category.

MR. BROOKMAN: Did you get that?

MR. DOUGHERTY: What I'm familiar with as far as the furred-down, I've only seen a select few manufacturers that offer those. So, maybe they're more prevalent than I'm understanding.

But, I'm thinking at least two manufacturers. I didn't know if it was a pervasive product or not.

Can you answer that, Jim, as far as --

MR. BROOKMAN: The question I think was directed towards manufacturers. Can you, can you --

MR. DOPPEL: We don't, we don't manufacture those kinds of products.

MR. BROOKMAN: Okay. Hang on just a second, Harvey.

Is there -- State, state -- You -- Do you want to restate your question, or do you think you've gotten as much as you can get?

MR. DOUGHERTY: Well, they're not particularly furred-down ceiling-mount units, because I've looked at two manufacturers that I'm familiar with that offer this product. Maybe I

should be looking at others, because I've got a certain understanding of what the geometry is, but maybe I haven't looked at enough.

So, I would be interested to know if there's more than two manufacturers out there that make this particular product.

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: Jim Crawford.

Are you referring simply to --

MR. DOUGHERTY: The indoor unit.

MR. CRAWFORD: -- a cassette unit in the, in the ceiling?

MR. DOUGHERTY: Usually sometimes has two side-by-side blowers using the slab. It's just a vertical slab, vertical --

MR. DOPPEL: He's talking a furred-down hotel room-type unit.

MR. CRAWFORD: But, if I had a circular coil, I think that meets your definition. I don't think that's what you intend.

MR. DOUGHERTY: No, and that's not what I intend.

MR. CRAWFORD: The single slab, and the

air flow is perpendicular to the air flow stream.

MR. DOUGHERTY: Okay. So, it needs to be --

MR. CRAWFORD: And, you know, cassette units are, I, I believe, made by numerous manufacturers, and very common in Europe in commercial applications.

MR. DOUGHERTY: Okay. Maybe I have to look at that.

MR. BROOKMAN: Jim, would you suggest how the definition would be altered to --

MR. CRAWFORD: I'd defer to AHRI to define, to get together with, with Brian and come up with a definition. And one of the things -- When I go home I'm going to have to look at and try to figure out what the mini-split is as contrasted to a small traditional system.

Where does it get "mini"?

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs.

I'm, I'm, I'm now confused about different issues.

MR. DOUGHERTY: Okay.

DR. SACHS: Are furred-down units as described here sold in the residential market as part of residential equipment?

MR. BROOKMAN: Do we have any pictures?

MR. DOUGHERTY: They were of capacity range that would have them covered by this test procedure. As far as a true residential system as a detached home, maybe not.

But, I've certainly seen them in multi-family applications.

DR. SACHS: Okay. Well, that's, that's helpful, and I appreciate it.

And I certainly haven't done the calculations, but under, with, with, with air velocities characteristics of residential applications, can I get 39,000 BTUs out of a single unit that fits into an 11-by-24 perpendicular?

MR. DOUGHERTY: I'll go back and look. I thought that was at the high end of what was available.

DR. SACHS: It sounds very generous in terms of residential, and it was, sounds very generous in terms of the capacity that I would, in

terms of residential zone that might be served by this equipment, which is basically an elaborate room air conditioner.

So, I would think that we might all feel more comfortable with a substantially more restrictive definition if the furred-down units are actually sold in the residential sector. Thank you.

MR. BROOKMAN: Thank you. I just want to check with the group.

Do you have a clear understanding of what these units are and what the break points are, or is, is that understood now?

(To Mr. Dougherty): Can you draw us a picture on a flip chart?

MR. DOUGHERTY: I could try.

MR. BROOKMAN: I'll get a pen.

MR. ANDERSON: There's a --

MR. DOPPEL: Here.

MR. BROOKMAN: Here. Here, use this one.

I'm, I'm seeing a lot of confused looks around the room. That's the reason I, I'm doing

this.

MR. ANDERSON: This is Wes at DOE, Wes Anderson.

Is the question about furred-down, or confusing with furred-down, or, and mini-splits, or is it just the furred-down units that you're questioning?

DR. SACHS: Harvey Sachs.

Wes, I take that as addressed to me, and I was thinking of it in terms of furred-down units in residential applications, whether they would be part of a multi-split system or single condensing unit, single evaporating unit.

I'm just not familiar with the application. That's, that's my fault.

MR. DOUGHERTY: So, I believe as far as on the return side there could be a duct prior to that before it gets to the blower, or the return could actually be right at the unit. But, basically the air is just brought in, and that, that, to generate over the coil.

And maybe a short duct is to get it out to your drywall drop-down, and then that is,

exhausts into the room.

MR. BROOKMAN: That helped me.

Karim, do you want --

DR. AMRANE: No. No. Fine.

MR. DOUGHERTY: You're fine? Okay.

MR. CRAWFORD: Relative to Harvey's --

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: Jim Crawford. Sorry.

Relative to Harvey's question, certainly you'd find this in hotels and residential, I believe, in these Regulations is defined bin capacity range, and by single-phase versus three-phase.

And if we're talking about single-phase equipment under 65,000 BTUs per hour for the system, we're talking about residential, regardless of how it's applied.

MR. DOUGHERTY: Good. Thank you.

MR. BROOKMAN: That -- Thank you, Jim.

Wes?

MR. ANDERSON: This is Wes at DOE. I'd like to reiterate that about ten percent of the residential market is considered a commercial

application, so it's --

MR. BROOKMAN: Okay. Thanks for drawing that diagram. It's good.

Okay, are we all set? We're going to move on now.

MR. DOUGHERTY: Okay, go to the laboratory installation provisions. And the first one here is a proposed adjustment in, as to how you set up your system, and particularly your indoor, indoor section, your indoor blower.

Considering here the condition of fixed-speed motors and variable-speed constant torque motors, whether or not the proposal was to allow reducing the air volume rate by as much as ten percent below the rated value, your target value, if you're not at it, which we showed on the, on the previous table or two, before having to switch to the next-highest conversion, and therefore a higher power draw conversion.

The second proposal was, was pointed out to us in making sure that although the next incremental change on particularly your dip switches may, may be the next one in line, that may

actually be an alternative configuration as to your fan delay.

So, just to, in addition there, whenever you make these incremental changes and you're forced to make these incremental changes in your fan configuration, that you do not change the blower delay. That is what, what is intended by the manufacturers for the rating purpose.

So, the goal of this set-up test procedure is to produce repeatable setups, and ultimately, then, consistent ratings so if, if a particular model is tested one day by the manufacturer, and that same model's tested another time by an independent test laboratory, what you ultimately want to have is that configuration to be the same.

You want the same dip-switch settings to be in place so that the, the power and the blowing characteristics of the unit are as similar as possible.

Currently in the test procedure there is an allowance to reduce this air volume if, in fact, when you set up, you're not at the minimal static

by as much as five percent to get to that minimal static.

And so the idea now is, particularly now with the constant torques supporting the variability, might be greater, such that the five percent may be too slight.

So, in looking at this, it, if we went from five percent to ten percent from a modeling, the effect appeared to have been you had a maximum on the high end as much as two percent degrees.

And the implication of that is that although the DOE doesn't have a certification requirement associated with capacity, the industry certification process does.

So, if, in fact, this is allowed, there's a chance of, more chance of a failure occurring as a part of that third-party certification process.

And maybe if you're giving up as much as two percent from the get-go, and the tolerance is five percent, you're getting closer and closer to that, that borderline of potentially failing. So, that would be one of the implications of allowing

this tolerance.

The second thing is more from a DOE perspective, allowing us the seasonal descriptors SEER.

Because that reduction in air volume would also have the reduction in power, the effect on SEER is less. It's more of four percent.

So, the effect there wouldn't be as problematic as the effect on capacity is. So, -- But, ultimately the, the, the goal is to have the consistent configuration.

And the concern, again, is that if you don't have the same configuration, the configuration at the next-highest speed would attach to a better HSCR than even this effect.

So, the question then becomes, as identified in the fourth entry in your June second document, was: Will these proposed adjustments of five percent to ten percent allow, provide a more consistent setup, a more repeatable laboratory installation, and then ultimately more consistent rating guides of at least SEER and HSPF?

MR. BROOKMAN: I see a few heads

nodding, but we would like to make that verbal.

Karim?

DR. AMRANE: I guess the comments came from us, so we do support that.

MR. BROOKMAN: Okay. Thank you.

That's good for the Record. Department wants that.

Other comments on the, this, the, the, identified as Issue Number 4?

(Whereupon, no response was had.)

MR. BROOKMAN: Okay.

MR. DOUGHERTY: Okay, now changing now to the refrigerant charging procedure, I want to improve a few things. The first thing that's in the DOE test procedure, it doesn't cover certain cases.

And one of the cases it does not cover is to give more guidance in the vent installation instruction, giving a range for a particular parameter. And in that case, the idea is to give more guidance in the mid-point as opposed to just the, the range.

Another item that was pointed out

through the AHRI was the fact that, well, as right now it's not explicitly covered, that you cannot change the refrigerant charge during the testing process.

In general, let's hope that that would not happen, but to be definitive and explicit. There's a proposal to state just that: You can't have a certain charge for the cooling test and another area that, for heat tests.

There's also a proposal to delete language allowing for the published installation and charging instructions to be, to be changed during the testing process and then revised based on whatever the manufacturer proposed to make a change during the testing process.

This was something that came about in a previous rulemaking in that the DOE test procedure was seen as a potential vehicle for getting better information out there as to how to charge a system.

Well, after further consideration by the industry members and DOE, we feel like this isn't the mechanism for doing that. You should test the unit according to the, the published installation

instruction.

And that's a little -- It's not something where this should be used as an opportunity to reevaluate whether or not those instructions are correct.

So, the expected outcome is to remove potential loophole for adjusting the refrigerant charge during the testing process once it's set for that first test, stating that published installation/charging instruction cannot be overridden during DOE's testing.

So, the option of using the DOE test mechanism as a mechanism for getting better charging done is now not encouraged, and overall it's just better alignment with the AHRI certification testing program.

Before I go on to, would there be any questions or comments regarding the refrigerant-charging proposed changes?

MR. BROOKMAN: No comments? No, no commitment? Or no --

DR. AMRANE: I guess as AHRI, we support.

MR. BROOKMAN: Thank you, Karim.

MR. DOUGHERTY: Going on now, installation, some clarifications with regard to the system setup procedure. And, and in this effort, it's mainly focused on the fact that the DOE testing is testing for certification purposes, at least comes at the very beginning of the product, actually before it's even, it's distributed for sale, as opposed to them saying that occurred thereafter, as in terms of certification or enforcement tests.

So, there's an effort in the test procedure to better delineate these two cases. And to that end, the first one is that a manufacturer, if they choose to go to an outside entity and have them do the testing for initial DOE testing, that, in fact, they have the right in full for interacting with that entity just as if they were having it done in their own test facility.

So, in this case, the application saying, no, it should be an interaction between the testing facility and the manufacturer, is waived because it's at the beginning and we wanted to

treat them fairly whether or not they had the capability to go in-house or had to go outside to do that testing, and trying specifically to incorporate tests where DOE certification can be, often be done on preproduction and before the publication of the installation instructions.

And those are not published with the units. They're actually not still finalized.

So, it's something -- That issue is addressed. The obvious thing here is once they were finalized, they need to be what was ultimately used to do the test on that preproduction unit.

So, the expected outcome here is to better differentiate between DOE initial certification tests and testing that's conducted thereafter, that there, in fact, there are installation instructions packaged with the unit.

The unit is packaged. It's -- Everything -- It's a commercial entity that's being sold.

It's not something that's still nearly at the end of its design process.

Any questions or comments on these?

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs.

I certainly understand the, the logic to the proposed changes, but there's something philosophically troubling as well, that the end of the day these boxes are installed by human beings who do not interact with the manufacturer.

At best, they will have been trained by a distributor. And in that context, the installation instructions, the set-up instructions are a key component of the product itself.

And I'm not sure how to operationalize this, but I want to point out that there's a loss in the proposed change, as well. Thank you.

MR. BROOKMAN: Jeff.

MR. NICHOLS: The way I'd interpret this, I -- If it's a private testing lab that the manufacturer is using, it's, for all practical purposes, it's an extension of what we're doing.

And the certification testing for DOE, the final DOE testing is part of the development process. And recat- is -- The literature's not going to be finalized until you finalize those

tests.

So, so, it's, it's almost impossible to have everything done. And when you're working to do that DOE certification, you're going to be pretty ruthless and make sure you have installation done the way it's intended to be done, even though it's in a third-party, private testing laboratory.

DR. SACHS: Thanks, Jim.

MR. BROOKMAN: Thank you. Okay.

Are there comments on these issues?

(Whereupon, no response was had.)

MR. BROOKMAN: Okay.

MR. DOUGHERTY: Changing now to test op-, test operating tolerances that apply to the air volume measurements, and also in-situ calibration efforts with regards to degradation tests, starting first on the air side.

The issue is airflow test operating tolerances are usually exceeded if using electronic pressure transducers that are, that are of the higher sensitivity. Currently in the test procedure, and these are longstanding values, there was a test operating tolerance.

Now, test operating tolerances during your test, a maximum minus the minimum value, that, that range cannot exceed these values. Vis-à-vis, in the case of the external static, that maximum range cannot exceed .05 inches.

And as far as your pressure drop across your nozzles, that cannot exceed two percent of the, of the reading. These tolerances are, are, are, predate the DOE test procedure.

They are something at least appear in ASHRAE Standard 37-78, and I suspect they actually precede that, that, that publication date.

These tolerances are relatively easy to, to achieve when you use a liquid manometer to make the measurement because of the liquid's inherent damping characteristics.

It can become a different story, however, with these high sensitive electronic pressure transducers, and more noticeable where you have a higher sample rate, and also where you have a variable-speed CMF blower where it's regulating during the tests.

So, those test operating tolerances go

in there in an effort to define a steady-state window in which to collect the data.

So, as potential corrective actions that were considered by DOE, the first one is to just eliminate those two tolerances and use other metrics as a means for defining steady-state conditions.

The second option would be, consider integrating the signal over time interval and, and calculating an average for that subinterval and using it for, as evaluating compliances with those test operating tolerances.

The third option is to try to mechanically dampen the pressure in an effort to mimic a liquid manometer. And there are these things called pressure snubbers that seem to do that.

And then, finally, the option would be to increase the magnitudes of these tolerances, given that this is what's happening. And the, the, the graph here shows a typical case of a system where you can see the fluctuations occurring; in this case are for the external static pressure.

And they do exceed the .05 tolerance that exists currently. So, at this point in the, in the test procedure, because we lacked sufficient data to evaluate in particular the third option there, we went with the idea:

Okay, let's, let's, let's consider the idea of, of, of wide-opening these tolerances. But, then, of course, the question becomes: At what point do they become ineffective in the practice of helping identifying a steady-state period?

So, then the proposed numbers are going from .05 up to .12 as far as that maximum/minimum/maximum variation, going from 2 percent overall as to that pressure difference across the nozzles, to as much as eight percent.

And these are not plus or minus. These are the total, absolute values for the ranges.

So, so, so, okay, so, so, so this item, then, there's a question in the NOPR identified as, as Number 5, and are greater tolerances the solution in terms of using electronic pressure transducers, because we certainly want to know that

we have pressure, not having someone having to read that liquid manometer.

So, in this case DOE's seeking comments on other actions as well as the one proposed.

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: I didn't want to interrupt. This is not a technical point, but it's a, an, an important procedural point.

In the Federal Register Notice, this actually, 37-78 is repeatedly referred to as, as an industry Standard. It is not.

This is a consensus Standard of professional associations. And I don't know what the current composition of the committee is.

Industry is always represented in the minority on an ASHRE Committee, and it's very common that employees of the Federal Government represent a significant percentage of the composition of ASHRE committees.

So, that is an important distinction. And its consequence, don't know at the moment.

But, I just -- It's something that needs to be kept in mind.

MR. DOUGHERTY: Thank you, Jim.

MR. BROOKMAN: Despite the fact that industry participates and it's considered a consensus Standard?

MR. CRAWFORD: It is a consensus Standard.

MR. BROOKMAN: And Industry participates?

MR. CRAWFORD: And, and the participants all represent themselves as professional individuals. They do not represent their employers, --

MR. BROOKMAN: Got 'cha.

MR. CRAWFORD: -- whether their employer's industrial or federal.

MR. BROOKMAN: Harvey.

DR. SACHS: Harvey Sachs.

Indeed, they even let folks like me on them committees. That's not what I wanted to comment on, though.

Brian, I'm just not clear. When I look at the graph on Slide 24 which shows a small number of outliers, -- It's the preceding slide.

MR. DOUGHERTY: Yes. And I'm stuck here.

DR. SACHS: Don't bother. I think we can all see it.

But, it shows a reasonable distribution and a small number of outliers.

Thank you.

Somehow it seems to me that those, in this respect, not in others, wasn't broke. So, I'm not sure why we're trying to fix it.

That -- Your Bullet Number 2, full signal integration, just seems like an aweful lot cleaner way that allows for the evolution beyond today's generation of sensors or anything else that happens in terms of preserving the relationship between the sensor and the test apparatus giving maximum flexibility.

I need to understand why I would not prefer Option 2, the integration to broadening them to accommodate these few.

MR. BROOKMAN: Meg?

MS. WALTHNER: Meg Walthner, NRDC.

I just wanted to agree with Harvey's

comment.

MR. BROOKMAN: Thank you.

Karim?

DR. AMRANE: I guess, of course, we checked with Interteck ourselves, but have you talked to them and --

MR. DOUGHERTY: It's their data.

DR. AMRANE: It's their data.

MR. NICHOLS: But, no. Jeff Nichols, Johnson Controls, wouldn't want to see the tolerance change.

We would prefer something where you're taking an average. If you couple this change with the opening the air flow tolerance up, you're opening yourself up to too much.

The variation gets too much.

DR. SACHS: Harvey Sachs again.

Just as a follow-up, I think there has to be a bound on integration, period. Clearly extreme.

It can't be longer than the test interval.

MR. DOUGHERTY: Right. Right.

And, in fact, that's one of the keys, Harvey, we looked at. Seemed like one minute in some cases didn't get us back, and we took two minutes.

Is there anything magical about two minutes? So, that, that, that, that's a key point.

MR. BROOKMAN: Jeff, please.

MR. NICHOLS: I think whatever, if you take an average, you want to maintain a -- Because a manufacturer may sample the minimal or they may sample a lot --

MR. DOUGHERTY: Correct.

MR. NICHOLS: -- more than that, depending on their software and sampling rates. So, you want to leave them the ability to average it over and beyond what the minimal sample is.

MR. BROOKMAN: Okay. Thank you.

Are there comments on these test tolerances and these four options?

(Whereupon, no response was had.)

MR. BROOKMAN: Okay.

MR. DOUGHERTY: Okay, now going to the effort to have an in-situ calibration. Need to

reduce the measurement bias that's created when using two different sets of air-side temperature sensors between the steady-state test and the cyclic tests that are used in tandem to come up with your cyclic degradation coefficient.

So, just as a review, you have that, these two companion tests. They come one right after the other; you know, the steady-state and cyclic.

And as far as that C-, CD value, it is used in estimating a part load factor which is a ratio of the EER when, when cycling to the EER at steady state.

So, the EER at steady state would reflect one set of temperature sensors used to get its capacity element, and the EER for steady state would be determined using the second set of temperature sensors.

And why do you have this potential for two different temperature sensors? Well, the test procedure couple automatically to ASHRAE Standard 41.1 which covers the temperature requirements.

There's requirements associated with

steady-state tests, and also for transient tests, and for steady-state tests there's more of a focus on accuracy, whereas for the transient test, of course, you have to also have lower time constants.

So, you have to have the faster responding. So, there's some differing differential equations that are needed to meet those two different requirements, given end application.

But, as applied here in the DOE test procedure, especially because it's used in a ratio form, it can have some impacts on the bias because you have two sets of temperature sensors, and ultimately you're never -- Well, not never, but unlikely. I don't think you're going to get those two just on their own to line up exactly when they're making a temperature-difference measurement.

So, the proposal in the DOE test procedure is to offer a correction method where you measure that temperature difference using both sets of instrumentation during the steady-state test.

Then you apply whatever ratio is

determined from that steady, steady, steady-state test to create the Delta-T that's measured during the cyclic test that follows.

So, you're getting them correlated during the steady-state test, and then you're using that correlation for your capacity correlation during your cyclic test.

As far as this proposed temperature difference Delta-T correction process, it would be one, again, that you would measure the Delta-T during the steady-state test.

And the proposal is to actually require that that measure be made at least every five minutes during the steady-state test, and that is a deviation from what's currently required. Currently the, you can sample everything as much as every ten minutes in the case of the Delta-T.

So, we're asking that to be reduced in half so we get enough data at least during that 30-minute interval. If you only test, you only tell us every five minutes, that will alter that Delta-T ratio that you calculate.

And so from the measurements you make,

you calculate the Delta-T for the steady-state sensors, a Delta-T for the cyclic sensors, and you would calculate then this ratio of Delta-Ts, and that would be used for the steady state.

That's what would be used to correct the Delta-T measurement during the second test. And now to, to at least avoid the case where there's something terribly wrong with the system where you have this great deviation in the Delta-T measurements, placing a, a limit on how much they can differ from one another before you're forced to stop your test and figure out:

"Well, I have two different sets of temperature sensors, and they're a degree, a degree apart. That's not acceptable.

"There's something wrong somewhere. I need to figure out where this, this error occurs," and potentially have to do a recalibration of one or two sets of instrumentation.

So, the proposal is to put a six-percent ratio on that that that can vary. So, the idea would be between .94, that Delta-T could vary from .94 and 1.06, and you could go forward.

But, if you find that that ratio is beyond that range, you'd have to again stop and reevaluate why the two sets are so different in their measurement of the same temperature differences.

And, and, and in an effort to avoid having to run a complete 30-minute test, we were trying to put limits on how short of interval could you run before you make that evaluation.

"Am I good or not good?" just to save a little time in the, in the laboratory on, per se. And the idea is to say you have to have at least seven data samples.

And that is if you make tests every five minutes, you'll get seven samples. But, you can't make seven samples in seven seconds.

You have to have some minimal value to evaluate that, and we're putting a minimum of six minutes. So, we're saying you have to have at least seven samples, and you have to have checked those seven samples at least over a six-minutes or longer interval before you make this decision as to whether or not I'm going to go forward or not.

So, at this point I'd welcome comments on this particular proposed effort. And I might point out here, although it is not part of the DOE test procedure currently, it is something that, that is being used as part of the AHRI series certification to evaluate their tests of the cyclic coefficient measurement.

MR. BROOKMAN: Jeff.

MR. NICHOLS: Brad, what's the maximum? If it's seven data points, the maximum interval, then I guess my mind is running short.

MR. DOUGHERTY: But, as far as if you use six minutes, that would be the interval.

MR. NICHOLS: Thirty minutes?

MR. DOUGHERTY: The interval would be six minutes. If you were taking more than seven samples in six minutes, six minutes would be the limiting factor that you have.

However many measurements you've made, you use all of them, they would be spaced at individual equal intervals. So, in most cases I think it would be six minutes for most manufacturers.

I think most of you sample at least every minute, if not less, in this Delta-T measure.

MR. NICHOLS: Okay, during, during the details, during the cyclical --

MR. DOUGHERTY: During the steady-state test, these measurements would occur.

MR. NICHOLS: Okay. So, so, you're -- So, the current sampling rate required is, is what interval?

MR. DOUGHERTY: Okay. Yeah.

The -- You could, you could sample every five minutes, but you, as a program, then would have to go to 30 minutes before you made your evaluation of whether or not you met the six.

MR. NICHOLS: But, the current, current sampling rate is what interval?

MR. DOUGHERTY: At least every five minutes, if not more frequently.

MR. NICHOLS: Yeah. Okay.

MR. BROOKMAN: At least every five, if not more frequent.

MR. DOUGHERTY: Right. If you prefer to make them every 30 seconds, that's okay, but to get

seven measurements you have to go 30 minutes to get seven measurements; one at the beginning and then -- Well, it ends up being seven.

Thirty divide by five and six, you've got the beginning and the end.

MR. BROOKMAN: So, there's a lot of, of specificity here. What do you think?

The Department's requesting comment on this proposed Delta-T correction.

Jim Crawford.

MR. CRAWFORD: Jim Crawford, Trane.

I think that although there's a lot of specificity here, there are at least as many open questions as there are specifics. And I think people need to deliberate on this before coming back.

MR. BROOKMAN: Okay. End with comments, then?

Okay. Well, then there are additional questions you want to put to Brian at this point, or can we get some additional comments on what's being proposed here?

Jeff, please.

MR. NICHOLS: Conceptually I think it's, it's a good idea. I think we want to work through the mechanics of how you, you, you, you correlate.

MR. BROOKMAN: Thank you.

Paul, anything for you?

MR. DOPPEL: (Nodded no.)

MR. BROOKMAN: Nothing. Okay.

Okay. Jim?

MR. CRAWFORD: Jim Crawford. It's well-intentioned.

MR. BROOKMAN: Thank you. Okay.

MR. DOUGHERTY: Since the Final Rule of October of 2007, the Department -- I'm sorry.

DR. SACHS: I'm -- It took me --

MR. BROOKMAN: Harvey?

DR. SACHS: Harvey Sachs.

It took me a while of how to think of a way to respond to Doug's comment that there's a lot of specificity here, and I want to phrase it in, as a question to Brian.

My sense is that the intent of these is to make the testing process, the certification process more rational, more replicable, and it will

not bias the results either up or down.

If that's the, the sense of it, then I think for those of us in the advocacy community, if it's not going to lead to loop-holing and it's going to achieve these results, we're all in favor of them.

MR. DOUGHERTY: It's meant to improve report repeatability.

MR. BROOKMAN: Okay, thanks.

Final comments on this?

MR. DOUGHERTY: Since the last Final Rule in 2007, the Department of Energy has received two Waiver Requests for products that are, have features not currently covered as part of the test procedure.

The first one that I'm referencing has to do with the case where the indoor blower unit has two cycles to the coil, but ultimately has multiple blowers used with that coil. And in August, 2008, DOE granted a waiver for a line of these such products as applied to the specific application as a single-speed heat pump outdoor unit and one two-capacity heat pump outdoor unit,

and the case of where there's two separate single-speed heat pumps applied with this specific outdoor requirement.

Because of the utilization of those commercially, the test procedure add-ons that are proposed are similar to what was granted in the Waiver. They're, they're basic, and it's minimum until we see how this progresses to understand whether or not this takes an industry and how it's applied.

So, the scope and the waiver, as well as the test procedure, is to cover products where the indoor system has between two and eight indoor blowers, and, as I mentioned, either the single- or dual-circuited indoor, indoor coil.

As far as simplifications, just looking at, at limited cases here. So, modelling on the indoor side mainly is a two-capacity system in the case of just looking at the, when half the blowers are on and when all the blowers are on, and not to look at other combinations that are possible there.

And for two-stage system, for those cases where there's either a type of two

single-speed heat pumps or a single two-capacity heat pump, in those cases we would define "minimum capacity" as occurring when half the blowers were on, and, and full capacity occurring when all blowers are on.

So, at this, I, I, I'm going to package them together and assess as a group, as opposed to individually, if that's okay.

MR. DOPPEL: Can I make a comment?

MR. BROOKMAN: Paul?

MR. DOPPEL: Paul Doppel.

In a way, I'd like to sort of object to this because this is like a multi-split if it has two indoor coils, and multi-split systems are required to turn one indoor unit off at low speed.

And so this is being treated differently, because both coils are allowed to remain active, unlike multi-splits. And that's one of the things that we, we, that we have proposed, change to the multi-split testing, which I was going to bring up later anyway.

But, I just wanted to make that association with that, that this, this, this type

of a system is being treated differently.

MR. BROOKMAN: Can you say -- Maybe I missed it. How would you address -- How would -- what kind of fix that you would like to see?

MR. DOPPEL: I think the testing procedure for the multi-split systems to allow all systems to operate at all times, all the indoor units to operate at all times.

MR. BROOKMAN: Thank you.

Do you want to follow on there, Brian?

MR. DOUGHERTY: I don't know that we can mimic that same requirement for multi-split stuff because in this case you can't turn off -- There's only one indoor, one coil to turn off, and if you turn off, there's no capacity, whereas a multi-split, you can turn off one coil at a time.

MR. DOPPEL: But, from what I saw on these systems, there should be a way to block refrigerant to one, and certainly turn off the blowers to one of the indoor sections.

MR. DOUGHERTY: Well, we are -- We're turning off both blowers in some of, in some of these.

MR. DOPPEL: But, both coils are working.

MR. DOUGHERTY: The case of a dual-cycle circuit maybe you could, but in the case of a single circuit I don't know how you can do what you describe.

MR. BROOKMAN: Well, operationally what's the common case?

MR. DOPPEL: Well, for the multi-split systems, again, the testing is intended to look at operations at low conditions. But, in low conditions you don't turn off one indoor unit, because all areas would be calling for heating or cooling.

So, -- But, the test requires one of the indoor units to be turned off, which inactivates a lot of the evaporator's surface, so you're losing capacity.

MR. DOUGHERTY: With the multi-split test procedure there is a need for test data to evaluate the impacts of having, keeping, moderating where you have all units remain on. But, now you can modulate between maximum and minimum values.

But, you do, in fact, turn off certain indoor units. So, in trying to capture those different features, the current test procedure does, at one test state you have to turn at least one of the indoor units off.

But, there's, there's an opportunity here soon to provide some test data that may help you evaluate what is the best way for generating a performance map for a multi-system, and that's been lacking up to now.

MR. BROOKMAN: Harvey. Pardon me.

Jim Crawford.

MR. CRAWFORD: Do we look that much alike? Yes.

DR. SACHS: I resemble that.

MR. CRAWFORD: The -- Are we talking about you're going to continue to have refrigerant flowing through the unit that is turned off?

MR. DOUGHERTY: Well, --

MR. CRAWFORD: If so, it's going to ice up, is it not?

MR. DOUGHERTY: Correct. And so, yeah, that's -- I don't see how to make the parallel

condition occur that's proposed for multi-splits in this product.

MR. BROOKMAN: No additional comments?

Paul.

MR. DOPPEL: No, I was just turning that mic off.

MR. CRAWFORD: Jim Crawford again.

I guess I would conclude from what you just said that you weren't really proposing a solution to the problem.

The problem remains. It changes character.

MR. BROOKMAN: Can you propose a solution to the problem?

MR. CRAWFORD: Not my product.

MR. DOUGHERTY: Well, I guess -- And, again, this product, to my knowledge, has not become a commercial entity at this point. In some ways maybe the expectations for doing that were overstated.

But, regardless, in trying to cover this product, I don't know what the typical mode would be to, in fact, turn off a circuit. The unit would

either have the refrigerant active, and if the refrigerant's flowing, the fan's got to be on, whereas when you have a multi-stage you can say, "Okay, that fan's going to be off."

I don't think that's a capability for shutting and taking it to zero. It's a different base.

I don't see how they correlate.

DR. SACHS: Harvey Sachs.

Brian, I'm hearing that so much lately that I'm wondering if it's premature to do a test procedure if we don't have a performance map.

MR. DOUGHERTY: I think that's a justified comment, and I guess the question, maybe it's good to understand, too, in the waiver process that at one point is that appropriate to occur?

Maybe in that case it's the, it's more to be on the front end of things as opposed to test procedures, to wait until you actually have an established product to make decisions on how to cover them.

DR. SACHS: But, Brian, I have -- If I have a Waiver Request come in over the threshold,

that would be accompanied with data. You'd certainly have the ability to ask for performance map in these conditions.

MR. DOUGHERTY: Data's available on prototype units, but I haven't seen a commercial product offered. So, it's kind of vague.

Test procedure options only come around every so often, so the timing's always: Should we try to grab it, or, now, or not?

The Waiver goes in place and stays in place until the next time we have an opportunity to discuss it, and there is this, the next time the test procedure is up for revision, that there be a way to do away with that waiver so it's no longer on the books.

MR. BOOKMAN: Karim?

DR. AMRANE: Karim Amrane, AHRI.

Maybe the best approach here, I don't know if there's no units on the market. The manufacturer has a Waiver.

Let's wait and see how it goes. And maybe, yes, that would be, yes, sometime in the future we'll assess whether that should be brought

into the test procedure or not.

MR. BROOKMAN: Okay. Thank you.

Yes, Jeff.

MR. NICHOLS: I'm not familiar with the product, but is this, as opposed to having a multi-speed fan motor that turns the blower speeds down, is this several, just several blowers that's, that's modulating the air flow in the same fashion?

MR. DOUGHERTY: Yes. And ultimately, potentially something, what would be the zoning feature that would be provided.

But, being able to, for example, we have to switch. Four of the eight blowers would be on.

MR. NICHOLS: So, a correlation to how multi-speed motors would be managed in this stage now would be the way to cover this?

MR. DOUGHERTY: The current test covers the case where you would have a modulating -- You'd have a single with a modulating that may have two stages or more of air-volume change. And so this is modeled after that.

MR. NICHOLS: Okay.

MR. DOUGHERTY: Coverage of it is

modeled after that.

MR. BROOKMAN: Final comments of this segment?

(Whereupon, no response was had.)

MR. BROOKMAN: Okay.

MR. DOUGHERTY: Okay. Another waiver was granted that affected a line of, a term here, triple-capacity northern-climate heat pumps.

And so from February of this year, DOE granted an additional Waiver on a line of such products that offer three stages of compressor capacity modulation at heating, two stages when cooling.

So, the, the features of this product would require changes to the current coverage for the heating seasonal performance factor, HSPF, but not for the SEER determination.

The SEER test procedure currently covers the case of having two stages of, of capacity modulation and, and cooling.

As far as what's in the Notice of Proposed Rulemaking, it is a little bit different in one sense from what was granted as part of that

Decision and Order.

So, what's proposed in the, in the, in the June second document is to additional testing to characterize the performance at this, the highest stage of heating capacity, this, this third stage of heating capacity.

There is a new outdoor test condition currently in the DOE test procedure on the heating side. The test conditions as far as the dry bulb conditions are 62, 37, 35, and 17.

The test procedures propose to use a 17 test, but in addition, require an additional lower-temperature test. And in the NOPR what is proposed is a dry bulb temperature of two degrees Fahrenheit and a wet bulb temperature of 1 degrees Fahrenheit.

And this does differ as far as the, the offset as opposed to what is in the, in, in the Waiver. In the Waiver, the manufacturer asks for 0 degrees and minus two.

The proposed change there is based on some feedback from laboratory tests that says a one-point depression is a whole lot easier to

achieve than a two-point, two-degree depression.

As far as the calculation side of things, the proposal is to define the heating load line based on the capacity at the second stage of heating at 47 degrees outdoor temperature, and this is consistent with their approach that's currently used for available speed conditions that have the capability of operating at a higher capacity during heating as opposed to cooling.

So, if any of you dug into it, there's a nominal test when testing variable heat pumps. So, this would be similar to that in defining the building load line that's used in calculating the HSPF.

As far as the calculations themselves, it's just an extension of what is in there now with regard to coverage to two-capacity systems. You just now have to consider a, a third step of modulation, and the algorithm does attempt to account for manufactured features that would say, "Okay, at certain outdoor temperature ranges I'm going to lock out certain capacity capabilities, as at the lowest temperatures.

"For example, I may not let my system operate at, at the, at my lowest capacity, and likewise, at the more moderate temperatures I may not let my system operate at this, this highest capacity of, of, of operation."

So, the, the question that was collective here on these Waiver-covered products was Issue, Issue Number 10 in the, the June second published document, and that's the question:

Is -- Are this -- Are these appropriate ways to address these particular products, those having multiple-blower indoor units and the triple-capacity northern heat pumps as the, and are these effective?

Are they sufficiently generic to cover? Because, obviously, the waiver process would be focused on that particular line of products.

And do we sufficiently make it generic, and do we capture the, the features that are being brought forward as part of it, these new product lines?

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs.

Brian, I guess the overarching question to me is, given that heat pump sizing for Northern heat pumps in particular is done to meet the load at lower temperatures, was any consideration given to moving the, the stipulated point from 47 for, for capacity, down to a more appropriate temperature, both for these and for all so-called northern heat climate zones?

We've, we've had the problem that the, the HSPFs are never reported for the, the northern zones anyhow.

MR. DOUGHERTY: And that's an option. There was an effort here to have a consistency so there would be a better way to, of, of comparing more conventional system.

So, what people tend to focus on is Region IV, and minimal designed heating requirement. So, to show the added effect of this added capacity at the lowest temperatures, there was a desire to have consistency to allow that comparison.

But, it could be possible, as you mentioned here, to do something, as stated, for

Region V, because it has a different bend distribution, has a different design temperature, had the calculation of the building load be different.

So, that's an option. Again, this should not be done in a way that dif-, dif-, disadvantages these emerging units, but it is a question of fair comparisons at the customer beneficial conditions and the contractor-selecting conditions.

DR. SACHS: Selecting a Wisconsin heat pump on the basis of 47-degree temperature probably is not going to make the Wisconsin utilities happy anymore, either.

MR. DOUGHERTY: And without too much time, you could, you could actually apply the, the rating method, the bin calculations for a select region application and follow those comparisons.

If you wanted to find the load in a different fashion, you could do that and make the comparisons. Now, it would be somewhat burdensome then to have all the manufacturers to do that, but, I mean, the calculation is possible.

It's just a question of, of can, can a, can, can a DOE test procedure be used to that extent? And I guess I'm not sure that it can meet all needs, so to speak, in this case.

DR. SACHS: Thank you.

MR. BROOKMAN: Paul.

MR. DOPPEL: Paul Doppel, Mitsubishi.

Variable speeds have a, a similar problem in that the requirement is to run the compressors at the same speed at 47 and 17 degrees for capacity for HSPF testing, when in actuality the variable-speed systems, most of them can generally rate more capacity at lower temperatures.

And it -- So, then they become like a triple-capacity or a high-capacity northern unit. And then some of the systems can even operate at lower conditions, down to minus-18.

So, there's -- You know, that sort of feature of these variable-speed systems is not really adequately measured by the current setup, the current testing.

MR. DOUGHERTY: Okay. I mean, there is an effort, because everything -- You had the

performance-map-generation side.

MR. DOPPEL: Yeah.

MR. DOUGHERTY: So, the effort there is to have con-, consistent operating occurring at the 47- and 17-degree test that you can interpolate for the outdoor temperature.

So, if it's a maximum, you should be able to get those two points and they should be able to extrapolate down to those. And the same way on the outdoor low side get that.

But, then you have to overlay that building load line. So, that's what that particular load, that once you had the performance map generated, what load line do you put over the top so they're related?

But, I'd be curious to see a little more of the understanding as far as why the current algorithm of the similar linear between the two outdoor is not quite generating the outdoor needed to cover these products.

MR. DOPPEL: Well, when you -- You know, for the homeowner, what they're concerned about is not whether the, really, the HSPF is at 17 degrees,

because with the variable-speed system they can get higher capacities than the compressor running at the same speed that it's, runs at 47.

So, what's important to the customer is: How much heat can they get at 17 degrees? And then that heat has a value to them.

And if it -- You know, it may cost them a little bit more energy, but, you know, it's still, the important factor is, and, you know, in some cases, like in a 12,000 system, 12,000 available-speed system, the rated heating capacity using the current test method would be 9,000, roughly.

So, that would be misleading to the consumer when they actually could get up to maybe 13,000 heating capacity.

MR. DOUGHERTY: But, the maximum is maximum. So, if you're generating your performance curve at whatever the maximum compressor capacity is at 1, what are saying?

The maximum at 1 is not the same at 47 that will allow top rate? Is that what you're saying?

MR. DOPPEL: That's what I'm saying. It's supposed to run at the same speed at 47 as 1.

MR. DOUGHERTY: Right. So, the next question is: Can you go to 1 and extrapolate it?

Because you're trying to create a bracketing of the performance, and in between there you're trying to get an intermittent point that will give you some idea of the nonlinearities going from minimum to maximum.

So, as long as maximum is maximum, we're okay. But, if it's not, is --

MR. DOPPEL: It's not. Yeah.

MR. BROOKMAN: Paul, it's not -- I want to make sure we fully hear what you've got to say.

MR. DOPPEL: Okay. Well, what -- The issue is that the variable-speed systems have a lot greater capabilities than the current testing.

MR. BROOKMAN: Uh-huh.

MR. DOPPEL: And, and that's -- There, there's a comment on that in the first few pages of the NOPR, and so we, we, in the letter that we sent in before, we tried to identify some of those inconsistencies with the current testing procedure.

MR. BROOKMAN: And what about --

MR. DOPPEL: And this just happens to be one of those, that on a heating side you can generate a lot greater capacity at lower temperatures because the systems are not fixed by compressor speeds like standard systems where you're on or off or maybe one or two stages.

MR. BROOKMAN: So, would you suggest additions to this proposed test procedure the way he's, the way Brian's described it?

MR. DOUGHERTY: This doesn't -- This is a separate issue.

MR. DOPPEL: Separate issue.

MR. BROOKMAN: Then, Jim Crawford.

MR. CRAWFORD: Jim Crawford.

I think, if I understand correct, this is an incremental version of something that supposedly was resolved about 25 years ago. There was a variable-speed heat pump manufactured by a company in the room, not my employer, that had a, a restriction of 60 Hertz for the drive of the compressor at, in the cooling mode, and 90 Hertz in the heating mode.

And I suspect that the capacity, assuming the load line was defined probably at 60 Hertz at 47, not at 90, and the heat pump, the whole premise of the heat pump was the fact that it could do as, as Paul is saying, and could operate at the higher speed at lower RPM.

And I suggest that -- Excuse me. At lower temperature.

I suggest that we need to revisit the history on that. You're familiar with the product of which I speak, are you not?

MR. DOUGHERTY: Yes. And the current test procedure covers that case.

You're absolutely right.

MR. CRAWFORD: And, you know, it ought to be fairly straight-forward, forward, forward. If I understood Harvey correctly, he questioned whether the utilities would like or not like this type of system.

And this type of system should defer the use of strip heat, so the electric utilities, if they're winter peaking, ought to really like it.

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Thanks, Jim.

MR. CRAWFORD: That's what I was trying to imply, that the rating method that does, does not easily allow a utility to give credit for the low-temperature performance is probably not sound public policy over the next decade.

I really think that I see a complex thing on the overlay on our present rating method, but we certainly, I don't want to obscure the performance at low temperatures of advanced systems of whatever type they are that you speak well.

In fact, in keeping the building low lined in a comparative basis would help, as opposed to: Did we get the higher HPF?

Because the load line would be typical of one not having that extra rating. So, the balance point would be so the A resistance heating that's going to be accounted for is going to be less.

HSPF is going to go up. So, I don't know how big of an impact, but it will have a positive impact, all other things being equal.

DR. SACHS: Yeah. Harvey Sachs.

And I very much appreciate that. The question is that if it's giving little bit of difference at the time that the utility is under maximum strain, it has much less value.

And I'm hammering on this because I'm trying to advance a slightly different agenda in terms of value of performance maps, and I apologize for trapping you in that slime. Thank you.

MR. BROOKMAN: Okay. Thank you.

Do you have any additional follow-on questions or anything here, Brian?

MR. DOUGHERTY: I did not.

MR. BROOKMAN: Any other comments on this segment?

(Whereupon, no response was had.)

MR. BROOKMAN: I think that we should take a break. This is rather dense material and there is more of it to go through, and so let's take a 15-minute break.

And we're going to -- The way I understand it, the Department has in mind this will, this will end around about 12:30. We may go a little bit longer than 12:30, so if you need to

have a piece of fruit or muffin or something to sustain you to 1:00 or, you should do it now, please.

Wear your badge in the building. There's a coffee shop on the ground floor straight on down the elevator.

If you're going to go out for coffee, go quickly, because it takes a while to get back in. We'll resume at 10:55.

(Whereupon, those present took a brief recess and returned, after which the following occurred:)

MR. BROOKMAN: Let's take your seats and start back up. In this morning's session I was getting concerned that somehow all this information was not landing in a comprehensible fashion, to be frank.

I, I, I saw a lot of kind of glazed looks as I cast my eyes around the room, so I put the burden on all of you. If you're confused or if you want further explanations, please speak up so that -- This is the purpose of this, is to educate, answer questions, and also deliver feedback to the

Department of Energy.

So, please weigh in that way.

Jim Crawford.

MR. CRAWFORD: Jim Crawford, who seldom admits to being confused. But, the -- I think the point is that the lead time here was very, very short on this meeting --

MR. BROOKMAN: Got yeah.

MR. CRAWFORD: -- and most of us have some deliberation on the issues that we need to do between now and the time that the final comments are due. And I think that explains perhaps some of the blank stares occasionally.

MR. BROOKMAN: That's good. That's -- And I appreciate that.

So, we could make this more tending toward a workshop format, where there was the exchange of information that would then benefit you in making your final comments.

Okay. That is to say, the exchange could be different, slightly different.

Okay. So, then let's proceed.

As I understand it, we are on about 35.

MR. DOUGHERTY: Correct.

Okay, I'm going to go into the weeds again; try to clarify inputs that are used in this demand defrost credit equation. There's a demand defrost, and the identified Fdef.

And it's a direct multiplier with the calculation of the heating seasonal performance factor. And historically that value ends up being some value between 1 and 1.03.

So, as a maximum benefit of a three-percent increase, if, in fact, you offered demand defrost capability on your heat pump. And that's to be positively verified during the frost accumulation test at 35 degrees outdoor temperature.

In the previous Final Rule in the previous rulemaking process there was comments to the effect that there, that there, this particular frost, the frost accumulation test could be, be extended, is allowed to extend as much as twelve hours.

And that can become excessively burdensome to conduct and to maintain the test

conditions and the tolerances over that long a (sic) interval. And so the proposal was that that needs to be shortened.

And that, in fact, was what was enacted. It was reduced as the maximum test duration from twelve hours to six hours, with the understanding that if most systems haven't gone through a defrost by six hours, they're either not going to go into defrost, or they're beyond help.

So, it made a lot of sense to decrease that interval, because the gain in extending it wasn't there. So, it -- That, that change was made on the testing side.

Full consideration on the calculation side was not given. So, we're going to now see, now that that test duration was changed, should we reconsider a modification to the cal-, the cal-, the equation of this demand defrost credit?

And two possible corrective actions were considered. Just to bore you with the equation, that appears in the test procedure.

This is what they used to come up with that crediting. It's, again, can be as much as

three percent.

And the two key elements here are in the enumerator. In one case, the Delta Taudef is the time interval between frost determinations.

So, -- Or, 1.5. It has to be at least 1.5, whichever is greater.

And the second one is what the manufacturer has as the maximum interval that they'll allow the unit to operate before they invoke a defrost; so, regardless of the demand side of the feature that says, "Okay, there's, there's a hard number that I'm not going to let it go beyond before I put it through defrost to make sure everything's good to go, or 12 hours."

So, right now that limit on Delta T-max was set on 12 hours. And so in part, it could be, to a certain degree, verified, though not in the laboratory, because the laboratory tests would allow you to go all the way to twelve hours.

But, now we're allowing that to only go to six hours to -- So, the question is: Should we make some adjustments here to the, to the, to the equation?

So, as far as potential corrective actions, -- I'm on Slide 37. -- one would be to update that equation that we were just looking at and change out that twelve-hour value with a six-hour value for that Delta T-max.

As to if the manufacturer offers a system that goes beyond twelve hours, we've gone six hours. No, you've got, you've got to limit to six hours.

Or, let's keep that current equation, but clarify the inputs that are used for it such that people still realize that the maximum time for the test is, is, in fact, six hours.

So, here's a graph of that, how that demand defrost would, credit factor would change for -- So, first let's start with what's currently on the books, what was part of the rule of 2007.

Well, actually, let's start pre-2007, where, in fact, you were allowed to go 12 hours for your test. For any defrost that would occur between 0 time and 90 minutes, one and a-half hours, you'd get the full three-percent benefit.

But, as far as after that time, if you

defrost at 100 minutes, two hours or beyond, you'd be at some value less than that. And how you would scale to 0 would depend on what the, the maximum value that was assigned for the manufacturer for that unit.

So, so, to the end point on the, the, the, what would intersect the X axis would be the hours associated with the maximum that, that the unit is allowed by the manufacturer.

And in -- So, in the case of the manufacturer allowed it to go up to 12 hours, it would be that, that blue line. And so any time defrost occurred at two hours, four hours, six hours, what it, it would fall on that blue line and that would be given at the, the credit.

Now, if we change from that twelve-hour being the maximum to that six hours being the maximum, you end up reverting back to the curve designated by the green line, the green dotted line there.

So, that's, that's the impact of saying no, because we can't truly confirm to the extent that we may want. Let's say we only can prove what

was the limit of six hours, and that will be our new line.

But, in that case you're going to have a unit, a system that's going to change its demand defrost unit because of this limit that's put on the test, not fail as to how the unit performs. It's actually just an artifact of changing the maximum test duration.

It may not be representative of, of, of what really happens. So, the alternative there is to stay with what is currently projection of that line, allowing it to be at a number beyond what is currently the green dotted line, but accepting the fact that because the test ends at six hours, you can only go vertically from your six-hour point.

So, any, any curve that would come down here, you'd have to take the intercept here, even though the unit defrosted beyond six hours. So, there would be units, although very few, that would take a defrost beyond six hours.

Now, I'm not familiar. That's the next point.

So, the DOE proposal is to the second

option, with the expectation that it's not going to change your HSPF if we go with this. It wouldn't change the HSPF for those units that defrost after an hour and a-half.

So, rather than do that, let's stay with our current approach, but in some way benefit units that would defrost beyond six hours. And there aren't many units that would defrost beyond this 54 dry bulb, 33 wet bulb, and not go into defrost within six hours.

And I think the majority of the units would be, "No, we'll be going through our defrost much earlier than that if we have a demand defrost."

So, the impact, you're going to affect units to one degree or another because of this change in the test duration. And I think the impact would be much less with the proposed approach as opposed to implementing that dotted line that's, that was shown on the previous graph to, to say, "No, we're going to limit to only what it correlates during the test of the maximum time of six hours."

Hopefully that was somewhat discernible, understandable. If not, let's talk about it more.

But, in, as part of the public meeting questions here is whether or not interested parties agree with this approach, or more or less leaving that characteristic line alone, but potentially having a slight benefit to units that would defrost beyond six hours, even though, as the context here is currently done, you stop the test.

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: Jim Crawford.

The, the comment that I'd like to make is that it, it appears that either option is going to change the HSPF of the product. And if we make a test procedure change that changes ratings, that raises all kinds of issues about the whole rating numbers, and whether, if they go down, that's going to confuse the consumer considerably that a product that, that on one day is, is X, and the next day is something less than X with their performance.

So, we've got concerns about it which we will elaborate in our formal comments.

MR. BROOKMAN: Would you imagine it's a

significant change?

MR. CRAWFORD: Any change --

MR. BROOKMAN: Got ya.

MR. CRAWFORD: -- is significant, --

MR. BROOKMAN: Okay.

MR. CRAWFORD: -- because -- Unless you want to, unless DOE wants to open up the tolerance band.

MR. BROOKMAN: Molly?

MS. TROMBLEY-McCANN: Molly Trombley-McCann.

So, I just -- I'm not entirely clear. When you also clarify equation input, what are you clarifying, that, that you're adding the maximum and minimum values in here where it can't be greater than 1.5 or less than the 12, or --?

MR. DOUGHERTY: Right now, just to explain to the fact in that equation that appears here, there were some comments that came back, "Hey, there's a 12-hour now," when, in fact, we reduced it to six. "Should I put six, or stay with the 12?"

In this case, no, just stay with the 12,

because it's something provided by the manufacturer, and during the tests you don't want that to vary; that unless you have to go all the way to 12 hours in the defrost, there's nothing in the, just to clarify, yes, just do a -- The equation shows they'll be, don't be reading into this, because the test only goes six hours, and that fact that 12 should be a, a six.

MS. TROMBLEY-McCANN: Thank you.

MR. DOUGHERTY: And to Jim's comment, it makes a lot of sense. And we have partitioned the proposed changes into sets being one near-term and a second set that would be timed to coordinate with the Standards compliance date; that maybe this one should be pulled out, the first set, and included into the second set.

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: Jim Crawford.

To the, the point raised about the clarification, I read that as the goal of this investigation rather than the effect of that chart.

MR. BROOKMAN: Karim?

DR. AMRANE: I guess question for Brian.

Have you, have you assessed the change on the HSPF percentage-wise?

MR. DOUGHERTY: Yeah. So, as a, as a worse-case, so you're always going to be coming vertically here.

As to the intersection point for any units, again, for the very small population of the heat pumps out there that would defrost beyond six hours, in, if we would go all the way to 12 hours, in this case they would get a 1.0-percent higher HSPF than they would in the worse case where they went to 12 hours and didn't defrost over that interval.

That's the biggest improvement they can get. Anything lower would be, would be lower than that.

So, if they defrosted down here, they would only get this incremental improvement, whereas they go further down this line --

MR. BROOKMAN: Karim, yes?

DR. AMRANE: Okay.

MR. BROOKMAN: Molly?

MS. TROMBLEY-McCANN: Molly

Trombley-McCann.

So, just to clarify, no HSPF is going to go down under the proposal.

MR. DOUGHERTY: Correct.

MS. TROMBLEY-McCANN: They would only go up.

MR. DOUGHERTY: Correct.

MR. BROOKMAN: Harvey?

DR. SACHS: Harvey Sachs.

And on those that defrost beyond six hours.

DR. AMRANE: Brian, this is helpful, but can you walk through that diagram for something that defrosts after five hours? I'm having trouble with that vertical axis.

MR. DOUGHERTY: Sure. Okay.

Okay. Okay.

Okay, you'll be coming in here then. As additional thing, as a manufacturer, you'd have to tell me what is the maximum that you would otherwise defrost, okay?

If you would otherwise defrost at six hours, you'd go to that line. So, your credit

would be 1., 1.01.

You'd have one percent. But, if you say, "I wait 12 hours," then you'd have a 1.22, so, a 2.2-percent improvement.

This is -- This equation was implemented in 1988 as part of the rulemaking done then, and had stood over time and there was no changes made to it.

As part of it, this last Final Rule, what was changed, it was maximum test duration of that laboratory test, this frost accumulation test, from a maximum of 12 hours to six hours.

MR. BROOKMAN: Jim.

MR. CRAWFORD: Jim Crawford.

Two points. One is you mentioned that you, you're not aware of many of them that defrost at longer intervals than six hours.

I, I'd point out that there are varieties of technologies of coils in the industry, and their frosting properties are not all uniform.

The second point is that the, the reading that I have received thus far is that, in fact, with units with longer defrost time, this is

a penalty.

MR. DAUGHERTY: I'd like -- Good. I would like to receive more understanding on that, if I could, part of the comments.

MR. BROOKMAN: Do you -- Can you elaborate on that comment, Jim?

MR. CRAWFORD: That will be elaborated upon in our formal comments.

MR. BROOKMAN: Okay. Okay, thank you.

MR. DAUGHERTY: Okay.

MR. BROOKMAN: So, final comments on -- Yeah, go back to the -- Go forward. Uh-huh.

You see the Public Meeting Question Number 2 does, seeks comments on the NOPR proposal to leave the equation for the demand defrost credit unchanged.

Are there additional comments on that one?

(Whereupon, no response was had.)

MR. BROOKMAN: Okay.

MR. DOUGHERTY: Changing now to miscellaneous items, the first is to explicitly add a calculation for something that is well-understood

in the industry, and that is: How do you calculate sensible heat ratio?

And the particular element that's added is with regard to the recommendation that it be calculated with the B Test, which is conducted at an outdoor temperature of 82 degrees dry-bulb temperature.

As far as this proposed addition, it would not increase the test burden, as these measures of the sensible versus the total are already made as part of the laboratory test. DOE is not considering using the sensible heat ratio as part of the SEER calculation, so SEER's unaffected by this proposed change.

When humidity control is a concern, consumers and their contractors may wish to know this value. So, this is just an opportunity for DOE to endorse its existence by adding it to the test procedure.

And it's something -- Where it goes from here, the potential next step would be if FTC so chose, they could see, have a rulemaking to see whether it should be added to the Energy Guide

label, for example.

But, we thought as a first step, to endorse it, especially for those folks who are proponents of hot, humid climate and don't have it. At least it would be a test procedure for adding endorsing that.

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs.

Southern Company is not present today, but in prior workshops has been a very strong advocate of having that information available, although they do not offer currently any rebate programs.

This could be a very important input to incentive programs in the Southeast. We would strongly endorse your proposal.

MR. BROOKMAN: Thank you.

Yes, Molly.

MS. TROMBLEY-McCANN: Molly Trombley-McCann.

Just to echo what Harvey has said, as a utility we would very much like to see that, see that on the energy guidelines.

MR. BROOKMAN: Okay.

Jim?

MR. CRAWFORD: As an informational point, we concur with the motivation here. The information is published by at least some manufacturers today.

The -- There is a, a measure of concern. As we talk about testing in different environments, we need to be careful that we define the, the environment and that set of conditions under which we are going to specify HSR.

And we are taking it that you're talking about an informational point here to be published in literature or web sites or whatever, as contrasted to another certified rating point.

MR. ANDERSON: Yeah, that's fine.

MR. BROOKMAN: Wes, you -- For the Record, Wes Anderson.

MR. ANDERSON: Wes Anderson on DOE.

That's, that's fine. Thank you. We don't have any comment on that.

MR. BROOKMAN: Okay. Thank you.

Karim?

DR. AMRANE: Karim Amrane, AHRI.

I guess what's being asked here is, is for manufacturers to report that information? I mean, okay, today, as you said, it's part of it, the test procedure.

So, it can be captured. So, what is, what would be the requirement of the manufacturer?

MR. DOUGHERTY: As far as the test procedure, this was just a starting point because it's not explicitly given in the test procedure right now. So, this was just the first attempt to get the very short list.

I'm not sure where this goes, Karim. It's something that needs to be discussed maybe at the Standards rulemaking.

But, as far as a test procedure is offered by some manufacturers, DOE felt like they wanted to endorse its use, so, so, to explicitly spell it out in the test procedure.

MR. BROOKMAN: Are there other questions or comments? Okay.

Yes, Jim Crawford.

MR. CRAWFORD: I -- Unless I've

misunderstood, when I say we publish the information today, the information is not published currently for most products probably in a format that the average consumer would even begin to comprehend.

There are performance tables that are published that have a variety of parameters from which one can derive the sensible heat ratio, but it isn't a block that says "Sensible heat ratio equals X."

MR. BROOKMAN: Okay. Any other comments on this?

We're going to move on.

MR. DOUGHERTY: Okay, the next one is just to clarify that if a manufacturer would choose in some cases to run optional frost accumulation tests and take on the extra test burden by doing so, then they would, then they would still have the option of using whatever gets the better results.

So, it's an attempt to clarify this and to encourage testing. And such a clarify-, such a clear statement as to if you run the optional test in the case of the cyclic degradation coefficient,

it says in there that if you run those tests and you still find that the default is the better option, which is unlikely, but if it was, you still have the option of using that default.

You have not forfeited it by running the test. So, it's the same as the frost accumulation type test.

And as far as making that decision of which one gives me the better value, because you can do it for different regions, there is a statement that says, "Okay, you use the one that gives you the better performance with regard to HSPF for Region IV."

And design heat, minimal heat design heating is a requirement. So, that would be the basis, as opposed to, "Should I use the Region V number? Should I use the Region III?

No, let's use the ones that are used for Region IV minimal design.

Any question with offering this, making this clarification within the test procedure?

MR. ANDERSON: This is Wes with DOE, directed to Jim Crawford.

Do you -- Would this address your environmental --

MR. CRAWFORD: I'm sorry?

MR. ANDERSON: You said -- Your previous comment was, "I'm saying the HSPF was the environment."

The -- I'm -- I assume the environment can affect that number. Does this Region IV satisfy that concern?

MR. BROOKMAN: You mean being specified as a default?

MR. ANDERSON: As a default.

MR. BROOKMAN: Yeah.

MR. CRAWFORD: I, I, I can't answer that question at this time, Wes.

MR. BROOKMAN: Okay. Well, the intent is clear.

MR. DOUGHERTY: Yes.

MR. BROOKMAN: Okay. Quick comments on this?

(Whereupon, no remarks were made.)

MR. BROOKMAN: Okay.

MR. DOUGHERTY: Okay. Finally, as far

as proposed miscellaneous items, one is to reference within the Consensus Statement actual ASHRAE 116 to have a little bit more resolution on their equation steps as to when you're going through the calculations for a variable-speed system, how you, in fact, do those interpolations for SEER.

So, it's proposed to reference those more, more resolution equations. So, rather than repeat them in the DOE document, refer to the ASHRAE document.

And then while we have the opportunity, we may have to add to these lists because there's always new Standards coming out, revisions and reaffirmations, to try to keep up with things. So, to reference the things as far as consensus, the ASHRAE and 210/240, we reference each other.

So, we're always catching up, and probably need to figure out a way to both be referencing our most current document also.

But, we'll reference the 2008, and then you'll revise yours and we'll be trying to reference it. So, this, this is kind of norming,

kind of trying to keep up with the Standards that are available.

MR. BROOKMAN: Paul first.

MR. DOPPEL: Please add HRI Standard 1230.

MR. DOUGHERTY: Right.

MR. BROOKMAN: Jim.

MR. CRAWFORD: I'm going to step back to, to Wes Anderson's question. I can't answer it now.

MR. ANDERSON: What was my question, again?

MR. CRAWFORD: The question dealt -- The question dealt with whether or not the choice between default or testing on CD would resolve the issue I raised earlier.

And the answer is, no, because the, I believe that, that the situation we were discussing earlier relates to tested, testing of, of cycling, and so the use of the default would not resolve that.

The whole purpose of testing is to hopefully demonstrate that your product delivers a

CD less than the default, a more favorable CD. And so anything that would adversely affect that is adversely affecting the, the rating of the product.

MR. BROOKMAN: Okay. I think we're about to move on to another section, --

MR. DOUGHERTY: Yes.

MR. BROOKMAN: -- which would be the Proposed Revision Set 2.

Before we leave Set 1, effective with the test procedure rule, that's, that's the differentiation point that the Department's making here. There -- Before we move on, any final comments on this entire section?

(Whereupon, no response was had.)

MR. BROOKMAN: There was a lot of content here. Okay.

So, -- And if anything additional occurs, we can back up --

MR. DOUGHERTY: Absolutely.

MR. BROOKMAN: -- to accommodate.

So, it -- Now we're going to proceed with Brian.

PROPOSED REVISIONS SET Nbr. 2:

MR. DOUGHERTY: So, the second set, as we discussed earlier, is dominated primarily to the EISA that came into play in December, 2007, and with regard to the demand defrost credit would be timed to occur at the same time as the compliance date for the Standards.

So, projected, maybe 2016. Okay.

One of the two things that were in, was in the EISA legislation had to do with --

DR. SACHS: I have a question.

MR. BROOKMAN: Yeah, sure.

DR. SACHS: Can we go back to the, the chart with the ASHRAE Standards?

MR. DOUGHERTY: Yes.

DR. SACHS: I'm going to ask a really stupid question, and I had to check with that. I -- It really is stupid.

MR. BROOKMAN: No, we have no stupid questions here. Really.

And I do my best to set a low bar.

DR. SACHS: What does "RA" stand for?

MR. DOUGHERTY: "Reaffirmed" in that year, 2009. Two-thousand-nine.

So, it's the '06 version.

MR. BROOKMAN: Okay. So, we'll proceed.

MR. DOUGHERTY: Okay. So, within EISA there was a requirement that products have to account for all modes of energy consumption.

They termed it "standby." And then there was "everything other."

And so its all-inclusive. And so the question is: Well, is standby accounted for in -- And, yes, SEER accounts for all modes of energy consumption that occur during the cooling season, including times when the air conditioner or heat pump is cycled off.

And same for HS-, HSPF. It does, also.

So, we're good in there as far as the heating and cooling season, but then why did, do I have another slide?

Well, it's because the cooling seasons and heating seasons in all cases, well, in all cases don't account for an annual basis. So, some energy consumption is being missed.

And in this case in particular, the main culprit is air conditioner, the air conditioner

sitting there idling. It uses some minimal amount of parasitic power, and that's not accounted for currently within the existing metric of SEER.

And, also, energy consumed by an air conditioner or a heat pump during the shoulder season. And where does that shoulder season come from?

If you take the current basis that is used for coming up with the energy consumption which converts to operations costs to cooling seasons and heating seasons, it used these maps that are called cooling load and heating load maps.

And if you look at any particular combination of any generalized region or particular location, those two can be converted to individual numbers of hours associated.

And if you sum those two, they were less than 8,760, which would constitute a full year. So, this is something that was, needed an ASHRAE Standard for compliance as ASHRAE 137.

And so it's a Standard here for moving forward with a standby/off-mode element for air conditions and heat pumps. So, DOE proposes to

account for this out-of-seasons energy consumption.

And as part of that proposal, they, they propose to define off-mode to, to define the seasons in terms of mode, and that was off-mode.

And so they were redefining a generic definition that applied to all products, to a definition that is specific to products covered by this test procedure of air conditioners and heat pumps.

So, for air conditioners, the off-mode is defined as when the units are off but powered during the heating season. And the shoulder off mode for heat pumps, that would be the same as air conditioners, except only apply to the shoulder seasons because it's actively performing a function during the heating season.

In addition to adding the, the definitions, to also look at adding additional laboratory testing to help quantify this parasitic power use, and then taking that laboratory data and adding calculations that could be used for representing the, the performance.

And so there's a proposal in there to

add two new parameters generically designated as P1 and P2.

P1 would be representative of the off-mode power consumption for shoulder seasons. So, that would be applicable to both an air conditioner and a heat pump.

So, whether or not it's 12 watts, 20 watts, whatever that representative value would be during a period, that would be representative of the outdoor temperature during a shoulder season period to so quantify that.

P2 applies to air conditioners only, and it assumes the same type identifier, a representative power consumption or rate quantity associated with the air conditioner sitting there during a, a, a representative heating season.

So, in this case we're doing away with the, with reference to "standby," because we've defined "off-mode" as such as covering this out-of-season period. We'll just stick to that terminology here for --.

Okay. With regard to the laboratory testing that's proposed for the off-mode

characterization, the testing -- I'm sorry.

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs.

MR. BROOKMAN: You're not on, Harvey.

DR. SACHS: I'm definitely not on.

MR. BROOKMAN: That was the microphone I was referring to.

DR. SACHS: You have defined P1 and P2 in terms of power consumption.

MR. DOUGHERTY: Yes, sir.

DR. SACHS: Am I to infer that the units are watts?

MR. DOUGHERTY: Yes, sir.

DR. SACHS: Okay. The legislation speaks of "energy consumption," so this will be fed in --

MR. DOUGHERTY: To an hourly value to get watt hours; yes, sir.

DR. SACHS: Okay. So, I still have the opportunity to get confused.

Okay, thanks.

MR. DOUGHERTY: Okay. Yes, Harvey.

DR. SACHS: This is a rate quantity,

power quantity. The legislation talks in terms of energy.

So, we'll have to multiply the hours associated by these particular, which will depend on the region. Maybe I'm jumping ahead of myself, but the DOE divides the country up into six climatic regions.

So, they'll be multiplied by these rate quantities to give up watt hours.

MR. BROOKMAN: Paul.

DR. SACHS: Brian?

MR. DOUGHERTY: Yes, sir. It --

DR. SACHS: Harvey Sachs.

A generic question that maybe shouldn't be addressed to you, but to industry. How prevalent are crankcase heaters in today's market?

MR. BROOKMAN: You said crankcase heaters?

DR. SACHS: Right.

MR. BROOKMAN: Do any of you wish to address that?

DR. SACHS: Are there any crankcases, crankcase heaters around?

MR. BROOKMAN: Jim Crawford wants to respond.

MR. CRAWFORD: The answer to the last question is yes, there are crankcase heaters around.

MR. BROOKMAN: You made it easy for him after I -- The earlier question was more open-ended, but do you want to respond to this one, Paul?

MR. DOPPEL: Not on crankcase heaters.

MR. BROOKMAN: No on crankcase.

MR. NICHOLS: I just affirm Jim's comment.

MR. BROOKMAN: Okay. We want -- I don't, I don't know where we go with that.

Do you want to follow on with that, Harvey?

DR. SACHS: No.

MR. BROOKMAN: Okay. Okay, so then we're going to take it back then.

You had another comment, Paul, yes?

MR. DOPPEL: Right. For the off-mode consideration, did you look at the various types of

single-speed, two-speed, variable-speed in determining this impact on this?

MR. DOUGHERTY: Take me a little further. As far as -- ?

MR. DOPPEL: Well, variable-speed systems would operate more, at more these times and not be in an off mode, as opposed to single-speed.

MR. DOUGHERTY: So, they should be covered under the calculation of seasons calculations. So, this is outside of what's covered by those seasons.

MR. BROOKMAN: Yeah, Jeff.

MR. NICHOLS: I think Paul's question is, you're saying variable speed's more likely to run during the shoulder seasons because it's providing some small measure of, of comfort different than what a single-stage is.

Is that -- That's the point you were trying to make?

MR. DOPPEL: Correct.

MR. BROOKMAN: Molly?

MS. TROMBLEY-McCANN: Molly Trombley-McCann.

So, the shoulder season hours are different for a single-speed as opposed to a variable-speed; is that what you were saying?

MR. DOUGHERTY: Actually, as calculated, they are not, because in coming up with the, the, the, the annual operating, the, the, the operating costs for the cooling season, you get that by defining a, a load.

And you define that load in part by, by, by designating the number of cooling load hours. And that is -- Cooling load hours can be converted into actual hours, which, if you would plug those into the original -- I'm getting too much of the bin calculations. -- you'd come up with the original energy.

So, you get the credit during the C and HF gift numbers. But, this is outside.

Everybody would be sitting there idle during this peak period. So, whether that should be reevaluated, we would have to go back and try to make things consistent then in this calculation.

So, that's a little more tricky. But, we could.

Right now the credit would occur with CHSWF.

MR. ANDERSON: Could I --

MR. BROOKMAN: Yes, Wes.

MR. ANDERSON: This is Wes at DOE. This also was addressed at the preannounced, this meeting.

DOE is also seeking comment, seeking data on the shoulder and off-season energy usage. So, if you could provide that information, that would be helpful in this analysis so we can get a more accurate reading, understanding of the, the hours that the sump, pump heater's being, that's on during that, during the year.

MR. BROOKMAN: Okay.

Karim?

DR. AMRANE: Well, a following question on Wes. Karim Amrane, AHRI.

How -- Did you cut labels out of 137?

MR. DOUGHERTY: Correct. Correct.

MR. BROOKMAN: Okay, Jim Crawford.

MR. CRAWFORD: Jim Crawford. I think perhaps we need to clarify a point here about

variable-speed versus single-speed systems.

During the cooling season, variable-speed should be expected to run more hours. During the shoulder season, when there's not a demand for cooling, responsible management at variable speeds says it's not running, and therefore there should be no difference in the shoulder season hours between variable-speed and single-speed, given that the shoulder-season hours are properly determined.

MR. BROOKMAN: Molly?

MS. TROMBLEY-McCANN: Molly Trombley-McCann.

So, this is a divergent question on the same topic.

MR. BROOKMAN: Please.

MS. TROMBLEY-McCANN: So, there are six regions that DOE defined. So, that's -- I'm interpreting that there will be six different off-season energy consumption values for each model.

MR. DOUGHERTY: You could go to that level, level of rigor, but the idea was to try to

get a representative value, because the likelihood is that, you know, the, the, depending upon heating season, it's not going to be that big of a difference as far as the power planning.

What's going to be the big effect is the hourly quantity because they differ so much from the southern to the northern climates. So, you're going to have much more.

If you had a heat pump, excuse me, an air conditioner in a northern climate, there's going to be a lot of off-load energy consumption, whereas if that same air conditioner was in the South, it would have a longer cooling season.

MS. TROMBLEY-McCANN: I thought that's what I was saying, not the hours, because you had the overall energy consumption.

MR. DOUGHERTY: Correct.

MS. TROMBLEY-McCANN: So, there are going to be six off-mode energy consumption values for each model.

MR. DOUGHERTY: There could be as many as up to multiple. But, once you have them, you can apply them to different application cases.

So, I look at it as more of an application issue as opposed to a rating issue. We have to pick one, one, one condition to rate them by, and I would assume it's probably going to be Region IV.

MS. TROMBLEY-McCANN: That was my question.

MR. DOUGHERTY: Yes.

MR. BROOKMAN: Okay. Other --

Jim Crawford.

MR. CRAWFORD: Jim Crawford.

Brian just used the word "rating." I'm assuming that it is not the intent that there, that there will be a standard minimum, a maximum standard set for P1 and P2 to which a given product will be held; that it's, it's a matter of the data to be provided for the information of the, the consumer and other parties, but it is not a rating in the usual sense.

MR. ANDERSON: This is Wes of DOE. We would probably defer that conversation for the Standards meeting, not the test procedure.

MR. BROOKMAN: Thank you. Okay.

So, Brian.

MR. DOUGHERTY: Yes.

MR. BROOKMAN: Yes.

MR. DOUGHERTY: As far as the test burden added because of the proposed testing, trying to keep it as short as possible, and it would be of a shorter duration.

In the case of an air conditioner, the testing is proposed to occur after you've finished all your cooling mode tests; in the case of the heat pump, to do it between the heating and cooling tests if, if we didn't sort of characterize crankcase heater.

So, if it didn't have a crankcase heater, it should be relatively simple to let it sit there and know that you have confidence in the average value that's generated. It can be relatively short duration for a crankcase heater that's on continuously, because, again, you'd need to characterize its function as amps.

The duration of the testing becomes a little more if, in fact, you have a crankcase heater that's thermostatically controlled, which

would be often the case here, though.

Because a heat pump is only being evaluated for its shoulder seasons, we were going to limit the, the temperature range that we're going to consider. And, in fact, the proposal is just look at, try to keep the dry-bulb temperature or pressure, and see whether or not, before 64 and 66, and see whether or not it cycles on and off, and do it for an interval to see, and make that the basis for the P1 value.

Now, for air conditioners, because we're looking at the heating season, heating season side of things, if it has a thermostatically controlled crankcase heater we have to look at other temperatures other than this nominal 65.

We may have to have it in a test room where we absolutely regulate the room temperature and see how that crankcase heater responds based on the fact of having to dissipate the heat in a colder environment.

And here it talks about once you'd have that laboratory value, what would be the calculation step? On Slide 47, to convert these

power values, you'd be multiplying them by, in the case of the P1, by the shoulder season hours.

So, if we just start at the columns to the left of the vertical green break, currently in the DOE test procedure it recognizes six generalized climatic temperature regions. In addition, it has rating values that are typically associated with HSPS that come out of the Region IV.

So, you can see how they varied, Region V being southern; Region V being a northern climate; Region VI being a Pacific Coast. And you can see how the heating hours and cooling load hours varied based on the location in the country.

And, if you want to see a map, I have a map I can probably bring forward later to show you how the country is partitioned. And so then looking at the right-hand side, using a logarithm, you can convert load hours into actual hours.

And that's done here to show what the corresponding actual hours are for these different, could be these different cases. And so if you look at the cooling season hours and heating season

hours, and the sum of those two, and they are less than 8,760, and the difference is what appears in the far right column of shoulder season hours.

So, the P1 value would be, would be calculated by quantity in the far right column to get the number associated with off-mode during the shoulder seasons.

And so for purposes of a value to, a single value to report that people could use for comparison basis, the idea would be -- Well, let's just use the same approach that's used now, and base it on the Region IV, but tie it to these ratings values of 1,000 and 2080 load hours.

And so the number would be 739 in this case. And then for air conditioners, that P2 value would be multiplied by the column that's two in from the right, the season, Heating Season's Hours, to come up with the energy that's representative of the system when it's sitting there idle during the heating season.

Is there interest to discuss any table and this proposed algorithm of going from power to energy quantities?

MR. DOPPEL: Can you go over the math on that one more time? Because it's --

MR. DOUGHERTY: Oh, you're funny. The, the watt values, and then you add them to times to get the watt hours.

MR. BROOKMAN: Go to the screen and walk them through it one more time.

MR. DOUGHERTY: Okay. I'm sorry.

So, so, P1 and P2 are, are watt quantities. They're watts.

So, to get watt hours, you have to multiply it by the hours that it's sitting there generating that, consuming that, that, that rate of energy. So, it's just watts times hours to give you watt hours.

So, P1, watts, shoulder season hours, watt hours. Same with P2 is a watt quantity, and so times here is a -- So, watt hours.

So, so -- And, and energy is -- Watt hours is a, is a, is a unit of energy.

MR. DOPPEL: I was looking at, more at how you came up with shoulder season hours.

MR. DOUGHERTY: Okay. As far as that is

concerned, you can take these combinations of cooling load hours and heating load hours and convert them to hours associated with actual watt hours of heating season and cooling season to where, for example, if you were doing your bin calculations, and rather than use those fractional bin hours that summed to one, if you actually used these numbers, you'd get the same using the fractional.

And you would get, you'd get the same HSPF of Region IV. So, finally, if you add these together, they end up being less than 7,606 of 9,760, and that is the difference between 8,760 and the sum of these two.

MR. BROOKMAN: Jim.

That was good.

Jim.

MR. CRAWFORD: Yeah, Brian. Jim Crawford.

What is the relationship between the two columns, "Cooling Load Hours" and "Cooling Season Hours"? And I'll have a follow-up.

MR. DOUGHERTY: Okay. So, the cooling

load hours are full load hours that the compressor would run during that season.

And it was developed when the, the test was originally in place. And that number is used to multiply by the capacity of the unit at its full load condition.

So, if you take this number and multiply it by the capacity of 95 from the A Test, that gives you your building load. And you divide that building load by your SEER value to come up with the watt hours that you consume.

So, these were used as part of the calculation algorithm to come up with energy consumed, and then ultimately the operating costs during the cooling seasons, and to operate the air conditioner or the heat pump during the cooling season.

So, these are full-load compressor numbers that were generated and, again, multiplied by 95 to come up with your season load. And divide that by efficiency SEER to come up with your energy consumption.

MR. BROOKMAN: Jim.

MR. CRAWFORD: Okay, thank you. I'm sorry.

So, if you would go -- If you would plug and use this to define the load, -- And in the calculation of SEER they use fractional bin hours for each bin. So, there's a percentage of time that you're operating between 65 and 70; a percentage of time that you're operating between 70 and 75, all the way up to between 100 and 105.

If you would change out those fractional bin hours and multiply them by the total numbers, -- Well, lets go to Region IV. -- by this number, you'd end up with the number of hours in each of those bins that, once you did the calculations, you'd come up with the same SEER value that you got using fractional bin hours.

MR. BROOKMAN: Jim.

MR. CRAWFORD: All right. The, the reason I asked the question is that cooling load hours don't correlate real well with compressor running hours, and compressor running hours is, you shouldn't be counting the time when the compressor is, is running as off-time.

So, you're, you're in danger of doing that. I, I think is that, that -- I'll stop there.

MR. BROOKMAN: Well, what would you suggest the Department do to remedy that?

MR. CRAWFORD: Well, I, I think that, that I, I'm not going to try to solve that, that problem extemporaneously.

MR. BROOKMAN: Could be --

MR. CRAWFORD: It's a nontrivial issue that I've raised.

MR. DOUGHERTY: Yeah. I'm starting -- That exists now, and so if I'm starting with something now not quite right, I'm making it worse.

I should go back one more step, because currently the test procedure that has those numbers in it for use in coming up with operating costs -- So, if, if they're wrong here, they're also wrong as applied.

MR. BROOKMAN: I'm wondering, Karim, for example, do they -- Are the manufacturers, are they able to say, to, to, to, to document the kind of the difference that Harvey's, pardon me, that Jim is describing there?

DR. AMRANE: Again, we've been -- I mean, this, those hours have been used, like Brian's saying, from, since the beginning. So, again, I mean, we haven't looked at that.

Maybe it's time to go back and look at it. I don't know.

I mean, it's something that, you know, if Jim has some concerns about it, we need probably to dig into it a little more, I feel.

MR. CRAWFORD: If you listened carefully to what Brian said, those are the hours equivalent to running at the rated performance of the unit.

MR. DOUGHERTY: That's right.

MR. CRAWFORD: Load at the rated conditions is much higher than the, than the load during most of the system. They do not represent the running hours, the compressor running hours.

And, you know, industry is in no better position to address that question than is NIST. And as long as the chart's up there and I've got the microphone, if I am not mistaken, Region I is kind of like Key West, and not much, not much more than that.

MR. DOUGHERTY: Yes.

MR. CRAWFORD: The tiny tip of southern Florida.

DR. AMRANE: It, it doesn't come up to Tyler.

MR. CRAWFORD: And Region VI is what? I believe Alaska.

MR. DOUGHERTY: Region VI is in California. But, yeah, Canada often uses VI.

MR. CRAWFORD: Point being that of those having heating and cooling ranges is somewhere between -- It's not a huge spread.

And speaking of huge spreads, I would speak to the test conditions under which you suggested one might test the thermostat for pump heater control.

MR. DOUGHERTY: Okay.

MR. CRAWFORD: I think you said 65 plus or minus two degrees.

MR. DOUGHERTY: I did.

MR. CRAWFORD: I think it, it's probably unrealistic to anticipate that the thermostat used for that function would be accurate to that kind of

precision.

MR. DOUGHERTY: And there's an effort in the test procedure to actually ask the manufacturer first what the values would be, and to agree if, to verify those. If they're in the bracket, use what was given to you and say, "Okay, that's what," so we have repeatable numbers.

MR. BROOKMAN: Paul, you want to comment here?

MR. DOPPEL: Yeah. Paul Doppel.

Just another point that variable-speed systems, again, would be operating, unlike single-speed, which would be operating on and off in the cooling seasons, and variable-speed operating systems would be operating probably more at the time, but at a probably much reduced energy consumption. So, --

MR. DOUGHERTY: Right. And I think the test was to confirm that, so I think in some degrees, hopefully would capture that.

MR. BROOKMAN: Karim?

DR. AMRANE: I guess I have another question for Brian. Have you done some tests?

Have you measured that, that off-mode energy consumption? No.

MR. DOUGHERTY: No, I have not. There's a Petition to try to get some testing done.

In fact, we met this week with our counterparts here to, to discuss having that opportunity before the Final Rule is, is issued.

MR. BROOKMAN: Are we ready to move on now? I think so. Okay.

Oh, Harvey, go ahead.

DR. SACHS: Harvey Sachs. Brian, this may be an area you're going to get to, but it keeps coming back and haunting me, that the objective I believe from EISA was to bring off-mode power out of the shadows.

And it's very important to set up a rating or reporting method that will encourage methods, technologies that minimize that. A, a thermostatically controlled heater that kicks in at 40 degrees instead of 65 would be an example.

I hope that you all are paying attention to that as you're developing a rating method.

MR. DOUGHERTY: The test procedure seeks

to, to generate a representative value for the power consumption value of the unit during the shoulder seasons and during the heater seasons. How it's used thereafter, I defer. So, --

MR. CRAWFORD: What would Justice Roberts say?

MR. BROOKMAN: Karim?

DR. AMRANE: Yes. Karim Amrane from AHRI.

For example, you're proposing some additional tests.

MR. DOUGHERTY: Yes.

DR. AMRANE: But, you haven't done any tests so far?

MR. DOUGHERTY: I've had limited communications with folks, so we will be better informed about this. Go ahead, please.

DR. AMRANE: So, you're expecting industries to try what you're proposing here to see if it works in a lab? Or, how -- I mean, are you -- I mean, because these are -- I mean, again, before going forward with this we should learn, as an industry, that this is going to work.

And I'm not sure finalizing -- When are you expecting to have a Final Rule on this?

MR. BROOKMAN: Graham, can you comment on that?

Graham Parker.

MR. PARKER: Graham Parker, Pacific Northwest National Lab.

That's a good question. And we do have a slide on that.

I believe the slide says 2011.

DR. AMRANE: That doesn't give us a lot of time here to, to test, make sure that, that we can get to billable numbers and things like that.

MR. BROOKMAN: Okay, thanks for raising it.

Jeff?

MR. NICHOLS: Could we go back to the testing requirements and walk through that, I mean, a little bit in more, more depth?

MR. DOUGHERTY: Sure. Unfortunately, I don't have a slide prepared, but, but, yes.

So, the idea would be, is to have this test occur after the cooling tests are conducted,

whether it be heat pump or air conditioners.

In terms of heat pumps, you do it before you start your heating tests. So, it would be in that transition period from your outdoor chamber, from cooling to heating outdoor conditions.

So, so, that's the -- If your, if your system that has either, does not have a crankcase heater or has a crankcase heater that's on all the time, you would operate for at least -- I can't remember if it's 20 minutes, but will collect data over a five-minute period where you would integrate the power.

And that would be used at your average value for your off-load energy consumption in all cases. That would be your P1.

And P2, because you do not have a crankcase, or it's on all times, it's not affected by outdoor temperature.

MR. NICHOLS: And that was within a range?

MR. DOUGHERTY: I'm trying to keep these in a range, and maybe these bracketings, but trying to stay close to your dry bulb. But, now I think

we're allowing, as you work towards that 70 degrees on the indoor, allowing that to occur so you're not holding up the testing.

So, there's a bracket on the indoor saved to where it would naturally go in extended idle condition. And then, so, yes.

So, then 656 is, is the target value for -- Excuse me. Sixty-five is only the target value if it's a thermostatically controlled unit.

If it's not thermostatically controlled, it should not be affected by outdoor temperature, so you should be able to make that while it's sitting idle. Nothing's working long.

Now, it will get where you can get representative energy, where you can get an average value. So, that's the first, where it doesn't have a crankcase heater; where that's well-understood.

I'll -- It's on all the time. The next time would be if you have a thermostatically controlled crankcase heater and where it's allied on a heat pump.

And in that case, where it's only, it's, the purpose is to test at an outdoor temperature of

65 and see what the parasitic power is in that condition. Now, if that crankcase heater is on, it's going to be reflected as being on all the time.

If that heater takes off, we're going to say it's off the time, not wanting to add too much test burden. So, that's the next.

The final case is if it's, is actually to start at a temperature in this outdoor to start before it's cycling. All these are off, and we're asking the manufacturer to tell us:

What is the temperature, outdoor temperature is going to be representative of coming on, and what's the representative temperature where it could stay on continuously, and then do a linear interpolation of those numbers based on that amount of time associated with operating at the different outdoor temperatures that are used as part of the HSPF calculation.

But, as far as the tests, it's to start with your chambers at a warm enough outdoor condition where your crankcase is not operating, and then decrease that temperature to where it does

start to cycle on.

At that point, see if that's within two and a-half degrees of what the manufacturer said. If it is, use the manufacturer's numbers as to that for your calculations.

Then you're supposed to decrease the outdoor temperature between ten and 15 degrees further on the outdoor side, and then monitor again how much, for an interval, how much is that cycling on, and versus off.

So, you get a two point on your linear point as far as percentage time on. And then you can extrapolate that to see if that correlates with what the manufacturer says, whether to be a hundred percent on time --

Sorry. We're in the weeds here.

-- to see if that's a good number.

If it is, you use the manufacturer's numbers to say, "Okay, 65 is first time it's going to cycle on, and going to off-cycle once it gets to ten degrees outdoor."

And so you would adjust linearly refer to periods of specific operation. I'm not sure if

that quite made sense, but at, it's a long type of a process.

But, that's, that's the idea behind it, is trying to some degree ask the manufacturer what would be the characteristic response of this crankcase heater, and to the degree possible, verify those numbers before using them in a calculation.

MR. BROOKMAN: Jim, go ahead.

MR. CRAWFORD: Jim Crawford.

I would urge that NIST communicate with AHRI Small Unit Engineering Committee on this and come up with something that represents both the rigor sought by NIST, as well as the feasibility sought by the manufacturers of the equipment.

I suspect that there's more variability than you may have, --

MR. DOUGHERTY: Okay.

MR. CRAWFORD: -- than you may be taking into account.

MR. BROOKMAN: Okay.

Harvey.

DR. SACHS: Harvey Sachs.

Brian, this seems to be a very hard problem, and I don't know much about thermostatic controllers, but, one, I know of two end members.

One would be -- One is that you will attach sitting somewhere in the sheet metal. The other extreme, some premium manufacturer of compressors says, "I'm going to put that inside the can."

MR. DOUGHERTY: Right.

DR. SACHS: "I'm going to put that inside the, inside the compressor can."

And at that point the time constant for changing the temperature of the test chamber becomes a very different animal in terms of response to that system.

MR. DOUGHERTY: Well, it would have an affect as far as: How long do you think you should sit and wait until it's gone?

But, because we're going to maintain fixed temperatures during these times, even though we're going to two different values. So, it's not as though the thermostatic is going to respond differently in, based on the rate of change in the

outdoor temperature.

DR. SACHS: Sure, if, if I'm dropping that rate quickly. But, will I have a low response time because it's mounted well inside the can?

Then I might well have gotten down to an outside temperature of 35 before the inside of the can has gotten to 65.

MR. DOUGHERTY: Yeah. Okay.

So, if it's going to be, the outdoor condition's going to be steady-state for these tests.

DR. SACHS: I understand. But, depending with what I'm suggesting, --

MR. DOUGHERTY: How long we wait before we'll start seeing --

DR. SACHS: Is that -- If you're trying to get hours out of this, you have to control for the rate at which you're changing the chamber, I think.

MR. DOUGHERTY: Well, I think once you got to the steady-state conditions in the chamber, the question is: How long do you have to wait until you can get repeatable responses from your

system?

DR. SACHS: Right. Right. Right. Thank you.

MR. BROOKMAN: Jeff.

MR. NICHOLS: Harvey's got a very good point, because you have, as you require, you soak the system. And if someone gets innovative and puts something inside the compressor, that soak time is substantially higher than a thermostat out in the air.

I mean, you're talking in terms of several hours for soaking.

MR. DOUGHERTY: Okay.

MR. NICHOLS: In my opinion it's a very burdensome test for the minuscule value that is being received. It's not worth the pay.

The payback's not there for that, that burden.

DR. SACHS: But, the, the flip side of that, --

Harvey Sachs again. Yes.

-- is the -- I'm trying to think in terms of strapping that, minimize the use of this

off-cycle power, and something which has a longer integration constant. Something which does require the heater to come up during the shoulder seasons which has a high dial usually actually has an advantage in terms of energy use.

So, I'm just asking you that you set up your writing nod in the way that, urging managers to design in ways that reduce this off-load power. Thank you.

MR. BROOKMAN: Okay.

Other comments on, on this?

(Whereupon, no response was had.)

MR. BROOKMAN: Let's move on.

MR. DOUGHERTY: Before I leave this, a couple of key points here is that the off-mode internal consumption will not be used to adjust the existing metrics of CNF. Doing so would have the following impacts:

You'd change the cooling season descriptor of SEER to an annual descriptor in the case of air conditioners, and into a part-year descriptor in the case of heat pumps.

And, you would change SEER from being a

regionally independent quantity that applies regardless of latitude or longitude, to one that would be specific to a particular combination of cooling season hours, heating season hours, and shoulder season hours.

So, I want -- I -- So, I just want to maybe head something off at the pass. So, we'll require in the test procedure when the Energy Conservation Standards become effective that the measuring of P1 and P2 be conducted if this goes forward.

And so it's, it's not something in the near term, but, in fact, it's something that will be proposed for additional test burden five years out or so if it, if it's enacted.

So, the questions that are in the, the written document, the published document is we seek comments on this definition of "off-mode." And, as far as generally the algorithm that we've been just going over, which appears in this Section 3.13 of the regulatory language part of the Notice of Proposed Rule as to this algorithm of going through and coming up with a representative character,

characterization of how this, if it is a thermostatically controlled crankcase, operates.

MR. BROOKMAN: So, why don't you back up one slide?

Comments on these key points with respect to off-mode?

Karim.

DR. AMRANE: I think we agree with, with, with DOE on, on having this off-mode being totally separated.

MR. BROOKMAN: Harvey?

DR. SACHS: We do, too.

MR. BROOKMAN: Okay. Concurrent.

DR. SACHS: Harvey Sachs.

MR. BROOKMAN: Thank you. We're going to move on.

MR. DOUGHERTY: Okay.

MR. BROOKMAN: Jeff's got a comment.

MR. NICHOLS: And perhaps this isn't the proper meeting, but I guess, assuming if, if that gets enacted for testing, we, is to say I guess I'm, I don't know what the Standard is to know what the test procedure is, so am I going to be subject

to multiple samples like I am for my, my SEER and HSPF requirements, or is this one item, since it, it's only being baked into the annual energy concepts, or what's the conceptual framework?

MR. ANDERSON: This is Wes at DOE. That is a Standards question and it will be addressed in the NOPR or, or, or at the NOPR meeting for Standards of CAC.

It's -- We are setting measures now.

MR. NICHOLS: Okay.

MR. BROOKMAN: Karim?

DR. AMRANE: That begs another question. I mean, we are talking about -- What? -- less than a year.

Okay, you going to come -- You going to finalize this test procedure at the same time you're finalizing rulemaking on central AC and furnaces, and at the same time you're going to get the manufacturers to come up with a, you know, with a binding off-mode.

And where there's been no test done on the equipment, we don't even know if the test procedures will work or not. I mean, I've -- Those

issues are very important for us, and I think that, I hope that DOE is taking those into account, because we are running out of time here.

MR. ANDERSON: Wes Anderson, DOE. Yes, we are. Thank you.

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs. And it's perhaps foreshadowing Standard-setting, but we do have a difference here between P, P1 and P2 on the one hand, which are measurable numbers, the, the power consumed during off-mode, presumably, with the heater at once present and in operation.

It's relatively easy to do that as a certified number. It's extremely difficult, I think, from this conversation, to do the, the hours.

And I wonder if DOE would meet many of its objectives by restricting the certification to the P1/P2 class, and then it's much less important how we do the computation of the annual energy as simply an arbitrary algorithm.

MR. ANDERSON: This is Wes Anderson of DOE.

Could you put that also in your --

DR. SACHS: I promise to try if I remember it.

MR. ANDERSON: Okay.

MR. BROOKMAN: Thank you.

So, we ready to move on?

(Whereupon, no response was had.)

MR. BROOKMAN: Okay.

MR. DOUGHERTY: The second aspect brought forward in the energies legislation of 2007 was the idea of where, for air conditioners and heat pumps, as well as furnaces, in addition to a national Standard which we have now, that they could investigate the possibility of implementing regional Standards, in the case of air conditioners and heat pumps up to a maximum of two regional Standards, and overlay to the national Standard.

And so the question then becomes to, to allow, though, consideration: Is there a need for changes in the test procedure?

And so we'll, we'll go through some of that right now as far as the influencing factors, then, are constraints on the test procedure, given

the framework that exists. Out of this came the idea that, "Well, there's a leading interest to the Standards rulemaking to these regions that would be defined as hot humid and hot dry.

Because of that focus, then, the necessary parameter of choice and the operating mode of choice is therefore cooling.

One of the requirements of EISA that also influenced the, the, the test procedure here is the fact that when you define a region, it must be composed of contiguous States.

So, in the case of a calculation that has weather data, it will depend on what States are selected for that region as to what the, the temperature distribution that will be considered in coming up with that rating if seasonal rating is pursued.

And it's dependent, then, ultimately, on these regions, what States make up these regions. And that, in turn, depends on these established in Standards rulemaking that are going on for central air conditioners, and also furnaces and boilers.

And ultimately, then, too, given the

current structure of the test procedure, how can, can we go about addressing a regional issue? And given that current, the current approach of using seasonal representation through the SEER descriptor, can that be used in a way to allow an evaluation for a regional metric?

So, as far as the test is concerned, the options before it were: Let's make no changes to the test procedure, not with regard to the laboratory testing or the calculations.

We will use the existing metrics, the national metrics of SEER on this case because it's the cooling-dominated focus as the regulating focus. So, if it was to be used, if a regional Standard was found to be feasible, we would use a SEER value that would be higher than what is required at the national level.

So, to, to sell in that particular region you'd have to have a SEER value that's otherwise higher than what was specified for the region, for, for the nation, excuse me. See, so that's one option: Don't change the test procedure at all.

The second is: Don't add test burden. So, in that case, you don't add to the testing in the laboratory, but you look to think that could be done on, on paper, and one would be coming up with SEER data that is more aligned with the weather conditions in the area you're considering.

And the third option there is: Add to the test burden. Add both laboratory tests and alternative calculation algorithms that would allow you to come up with a region-specific regulate-, metric.

And you could come up with SEER hot dry, or hot humid, or some other within the bound allowed you by, by, by legislation.

So, we chose to go the all-encompassing route with the, with the, the understanding that the going from a proposal to the fodder rule, it's easier to go more expansive and curtail it back, as opposed to coming up with something more focused and expand it.

So, we chose in the Notice of Proposed Rule to, to go the route of saying: Let's see the option of adding testing burden, and along with

calculations that are new, and, and focus those, though, on the, to, on the dry region and see what kind of reception that gets.

And it's kind of taking a step back here in part on Slide 52. Let's maybe discuss what we seek with regard to a regional regulating metric.

Certainly from the DOE's standpoint it would be one that would allow better, that would promote better use of our natural resource, our energy resources.

From the standpoint of the consumer, they would like information that would help them determine their, their energy bill. And part of it that is -- Most of that is usually associated with seasonal operation: how much energy you consume over a season; how many kilowatt hours you consume.

So, SEER has done, has attempted to do a job and providing more information. But, as more utilities also go to split-meters and have, and are capable of handling a charge and demand to that, maybe that metric falls short.

So, maybe there's a need to transition to some degree because of the evolution of the

metering and charge practices.

As far as another thing, utilities often seek information that helps them toward their avoidance of peak-demand situations. So, they would be most likely interested in full loads conditions, and so regulating Regulations that would help them in understanding those full-load characteristics.

And finally, this can be used by manufacturers to help differentiate the products from one another.

So, at this point I'll throw out the question that's, appears as Number 9 in the, in the published Federal Register Notice. DOE seeks comments on the usage and effectiveness of the SEER hot dry metrics and its advantages and disadvantages.

There has been some feedback provided because of the timing from the Standards Rulemaking public meeting that occurred, and comments that have occurred and come into this, to this meeting. And so we would like to see if those comments would like to be reiterated here, or otherwise new

comments as to whether or not SEER hot dry is the way to go, and if not, potentially how to proceed, to proceed.

MR. BROOKMAN: Yes, Molly.

MS. TROMBLEY-McCANN: Molly Trombley-McCann.

First of all I just want to note that the NOPR Issue Number 9 is phrased differently in the printout, and I like the way it's phrased in the printout better --

MR. DOUGHERTY: Okay.

MS. TROMBLEY-McCANN: -- because in the printout it specifically calls out the use of EER as opposed to SEER hot dry. And that is definitely the priority of the California utilities.

Also, the way SEER has been designed with regard to NOPR, it does not adequately represent conditions at full load. It doesn't give the manufacturer the opportunity to differentiate products that will perform very well at high temperatures, and EER, at 95, is going to do a much better job of that.

We in the past said, and I would say

again that we would prefer an EER at 115, but I think we're not going to push our luck at this point. But, I do believe an EER is a much more appropriate metric for this region and for the goals that you've listed on that slide.

MR. BROOKMAN: Karim?

DR. AMRANE: Karim Amrane, AHRI.

I believe that the first slides here don't talk about the Consensus Agreement, but I think we'll have to talk the, the Agreement, because we specifically agreed to EER in those regions to address the concerns that, that Molly raises.

So, we would like to abandon this idea of SEER dry, and dump the Agreement, and I believe we'll resolve these issues.

MR. BROOKMAN: Okay. Thank you.

Harvey.

DR. SACHS: Harvey Sachs.

I'd like to turn attention in this context to the top paragraph on Page 32-, 31240, Column 1.

MR. BROOKMAN: Of the Federal Register?

DR. SACHS: Yes. The last sentence says, "EER and COP, for example, cannot be used."

MR. BROOKMAN: Wait a second. Let us get there.

Thirty-one- --

DR. SACHS: Two-forty.

MR. BROOKMAN: -- 240. Thank you.

DR. SACHS: After the section that, "... SEER and HSPF ...." Well, let me go up one.

"Notably, DOE does not have authority to use a performance metric other than SEER and HSPF...." And continues.

"EER and COP, for example, cannot be used."

MS. KOHL: Sir, this is Betsy Kohl. Just to cut off this discussion, we're still considering that issue.

DR. SACHS: Thank you, Betsy, but I feel it's very important to make two points. I appreciate that you all have had a filing and some discussions that may be helpful on this.

First point is that I'm a simple man, but I've tried my best to understand the rating

method, and SEER for single-stage equipment is nothing except a coefficient multiplied by EER at 82.

We would assemble to say that we cannot use EER because we've been using the EER at 82 since 1979.

The second point I want to make is with respect to the defined SEER hot dry. And again, I may have misunderstood it, but this proposes to use an adjustment of the bin hours, but still to base that for simple equipment on the measured performance at 82.

This absolutely confounds the engineering decisions that would be made in design as I understand it of a unit optimized for high-temperature performance. This is the most clever, ingenious proposal I've seen for defeating the intent of a hot-dry SEER.

It must be based on a temperature at 95, for which the measurements are already required in the rating method, instead of being based on a, a steady state at 82. Thank you.

And I'm -- I hope I'm wrong in my

inference, but --

MR. DOUGHERTY: I believe you are, Harvey, because --

DR. SACHS: Please explain it to me.

MR. DOUGHERTY: Two steps here. As far as the shortcut method that's in place now, the reason the shortcut method came in place was it gave you the same SEER as you did if you used the bin.

And to capture the effect of the regional performance, you, in fact, are forced to go to the bin calculations for the single source for hot-dry system if you want to go that.

So, maybe we missed the boat. So, that's what the intent was to be in there.

And I hope that's in there. It's used a different bin distribution as far as a weather data, and ended up with a load because of the, because of it.

You actually end up with a, an outdoor temperature that is exactly what we have now, 95 degrees. So, you're hot now.

The SEER hot-dry as proposed now does

not do it as far as identifying performance at the more extreme conditions.

DR. SACHS: And, thank you, Brian. Again, this is Harvey Sachs, and at that point I found myself somewhat surprised as I tried to understand Table 3.2 on the following page, 31241, where we still have a situation in which we are basing our calculations on a system in which 69 percent of the bin hours are at temperatures, as I recall, less than 79 degrees.

But, I'll support that in my statement so that, again, in terms of the, the goal here of reflecting society's interest in high-temperature performance. Even though I think I may have been early in proposing this approach, I'd like to formally renounce it.

Thank you.

MR. DOUGHERTY: You're right, Harvey, as far as the, the, the -- Because of the way the legislation is written, and that you have to have full States included, and contiguous States, and you have to partition up for a four-State region that ultimately was proposed here, we did look at

the two-State region, too, to get into calculations of hot and dry.

But, because of the population along the coast, and because you have California, it really pushes things to a much more moderate condition. So, it, it drives this thing to a large degree, and it really starts to separate what we can even call close to hot-dry.

MR. BROOKMAN: Molly?

MS. TROMBLEY-McCANN: I want to reiterate the vague NRC -- I just -- Molly Trombley-McCann.

I wanted to follow on Harvey's statement and note that we also submitted comments in support of the SEER. We would also like to backtrack and renounce our support for, for SEER hot dry in favor of EER, based on, you know, subsequent conversations with Industry and the Consensus Agreement.

We feel that that is something that the Department can do and should do as the best option. I also did want to note that, you know, we don't support SEER hot-dry.

We support EER, and there are a host of questions about how long SEER is supposed to be tested in this NOPR. But, not only do we not support SEER hot-dry, but in particular, we have a lawsuit concerning how it's to be.

MR. BROOKMAN: So, you reflect that in your detailed --

MR. DOPPEL: Mitsubishi would oppose SEER hot-dry because it would increase testing burden on manufacturers, and we're not in favor of that. And, we would support a Consensus Agreement.

MR. BROOKMAN: Thank you.

Harvey? You want --

Jim, you want in here?

MR. CRAWFORD: Harvey?

DR. SACHS: Jim, go ahead.

MR. CRAWFORD: Age before beauty.

DR. SACHS: I know. That's what I said.

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: Jim Crawford.

The, the interesting thing about this table that Harvey points out is that is, it suggests that the hot dry climate is very, very

cool --

MR. DOUGHERTY: Right.

MR. CRAWFORD: -- and temperate, to which Brian alluded.

If you look, for example, at the bins that represent 90 to 100 degrees, there are less hours, excuse me, a smaller number of the seasonal hours in that bin in the hot dry climate than there are in the standard climate.

And if you look at the coolest bin, you have double the number of hours in the coolest bin in the hot dry climate than you do in the national calculations. And the significance of this is that if, if that's all you changed, the SEER in the hot dry climate would be higher than, than the national calculations.

The reason I believe, and I've not gotten into all the details, but, but the reason that isn't is, at least to some degree, a function of two things, one of which is the indoor conditions have been changed, and indoor conditions have a significant effect on the performance of a system.

And the second is that the load line has been changed. And I'm going to have to look more at the load line, because it looks like, again, the climate shown is a milder climate than the national figures.

MR. BROOKMAN: Okay. Thank you.

Harvey.

DR. SACHS: Harvey Sachs.

I'd like to ask a question about the last two columns, the right-most columns in Table 3 dash-2. I'm inferring on no particular data, that the resulting cooling load profile reflects the, the building and does not include the effects of degraded performance of the equipment.

As the lift becomes higher, the lowered performance -- I don't say "degraded." That's value-laden.

MR. BROOKMAN: He was searching for it. You might need to restate that.

DR. SACHS: Sure. My inference -- Repeating, Harvey Sachs. -- on the last two columns of Table 3 dash-2, Resulting Cooling Load Profile, that this refers to the load line and to

the change in load of the building, but does not affect the change in performance of the equipment.

It seems that the equipment operates at a constant EER throughout these bins.

MR. DOUGHERTY: I believe that was how that was calculated. These -- This work in particular was done by PNNL, and so they were providing me with the, the bin distributions to, to add to the testing.

So, unfortunately, I believe you're correct, Harvey, but I'd have to check with the, the, the individual who worked that to, to -- I'll check. I'll confirm it.

DR. SACHS: Please do, --

MR. DOUGHERTY: Yeah.

DR. SACHS: -- because with all due respect to Paul's magic equipment, it would seem to me that I'm missing the point, and my operating hours will go, will be greatly impacted if the equipment is running at the lower EER than we would expect, as I believe would be reflected in this profile.

MR. DOUGHERTY: I'll check.

DR. SACHS: Thank you.

MR. BROOKMAN: Okay.

Jim Crawford.

MR. CRAWFORD: Dr. Sacks, your arithmetic is better than that. Your running hours are determined by the capacity, not by the EER.

The power consumption is determined by the EER and the running hours.

DR. SACHS: Thank you, sir.

MR. BROOKMAN: Okay. Okay, let's keep moving along.

MR. DOUGHERTY: Okay. Because of the expectation that we would get the response that we received this morning, -- And, and thank you for following up, because we, as I had mentioned, we, we had the opportunity to sit in at the, the Standards public meeting and see the comments. -- at this point, to save your time, potentially, and, and all our time, I wasn't going to go into the detail any further of SEER hot dry unless someone wants to do that.

MR. BROOKMAN: I don't, I don't see anyone -- I'm casting my eyes about.

MR. DOUGHERTY: Thank you.

MR. CRAWFORD: Off-line.

MR. DOUGHERTY: Yes. Okay, agreed.

Okay, changing now to some -- In fact, one of the things that Harvey brought up earlier, some related extras that are proposed, and some admissions, at least some admissions, and probably certainly others.

One extra is in, in bringing to the forefront this off-load energy consumption when you test a coil-only system. So, this is a system where it, it comes without its, its blower.

It's, it, it would have to typically get its power from the, the furnace to which it is retro, with which it is applied within field.

There's no stipulation to your test currently that you have to have a certain size transformer, and also whether or not you need to -- There's no specific statement whether or not you would need to meter the power consumed, albeit small, by that transformer.

So, in the spirit of trying to cover everything as EISA is pointing us to, there's a

proposal in there for such coil-only systems to say you have to use either a 40- or 50-volt/amp transformer to power your indoor site controls to allow the units to be tested and to actually have that power system into the overall metering of the system, the second bullet there.

Question?

MR. BROOKMAN: Harvey Sachs.

MR. DOUGHERTY: Okay. Sorry.

DR. SACHS: Thank you, Brian. This is Harvey Sachs.

You have used the term "transformer" rather than the more general term "power supply."

MR. DOUGHERTY: Okay.

DR. SACHS: And given what's happened in other industries, it would certainly seem to be in the public interest to consider using some default in allowing the manufacturer to show that the unit is to be installed with a better unit.

This would be comparable to the way we treat fan power in the air-conditioner test.

MR. DOUGHERTY: So, you wanted a default that --

DR. SACHS: Well, you're requiring a 40- and 50-amp power. What happens if Jeff comes in with a unit that's using a very low-level power supply to drive his forward?

Should he not get some credit?

MR. DOUGHERTY: Well, if it, it's provided in the unit, certainly they'll get that.

DR. SACHS: But, if this is a coil-only, would it not be provided with it?

MR. DOUGHERTY: Correct.

DR. SACHS: So, now, given the potential for it, maybe that will be captured when Jeff does his with coil units, or when he does his furnaces, because now he will get credit on the, the front side.

But, I hate to say "standard setup" with a, in a way that will distance, discourages innovation that would save energy.

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: Well, if I may, let me address Harvey's point first. I, I understand the point that he's making, and I think it deserves consideration.

However, we need to keep in mind that the overwhelming majority of systems in North America in the foreseeable future will probably not be variable-speed, and that means that they will be using contractors, and "transformer's" the correct term.

"Power supply" carries a, a bit of an implication of also conversion from AC to DC, which would not be the case for most systems.

The second point is addressing the substance of the issue, and, and that is that if these coils are currently tested without transformer power being accounted for, reasons for wanting to account for it is, are, are fairly clear.

But, it's also fairly clear that the effect of that will be to reduce the SEER ratings of existing rated equipment. And I was rather under the impression that that was not the intent of the current rulemaking process.

MR. DOUGHERTY: You bring up a good point, Jim. At least it wouldn't affect it in the near term, but you're right.

In five years out, or whenever the, the Conservation Standards were enacted, you'd have an effect on that rating against an existing piece of equipment.

MR. BROOKMAN: Go ahead.

MR. DOUGHERTY: Okay. Going on to the second bullet, then, as we mentioned earlier when we were talking about the additional measurements that would be made to try to affect this correlation during the cyclic degradation tests during the steady-state cycle, we talked about reducing the sampling interval from five minutes to ten minutes.

So, there's a new recommendation in there. Since we're going to do it for that test, maybe we should just, you know, bite the bullet and put five minutes in as the, as the maximum planning interval in all cases, because we've come a long ways since the, the test procedures was originally put in place.

And ten minutes really was not, doesn't give you much resolution. It would be nice to have more measurements; rather than having four

measurements, having seven measurements for calculations of your EER.

And so that's gone into. Given the progression to automation in the laboratories over the years, there's no reason they couldn't achieve that.

The last one gets back to Harvey's point earlier in that there's a shortcut system for calculating SEER, and it is a very simple one of the EER during the B Test of two times the part-load factor evaluated at a load factor of .5.

And so it's just EER B times 1, minus the CC B over 2. And it's a very simple calculation, but yet that calculation was generated because when they first came up with the algorithm, they found that, in fact, they correlated well.

So, if you do the full-blown, full-blown bin analysis versus the shortcut method, you get very close to the same SEER value. And I don't know more than that, but that's why it came into being.

But, maybe it's time to revert back. Maybe it's time to revert back so we can avoid that

kind of confusion, and also get some benefits.

Because it is tied to EER B, maybe it emphasizes A to B. So, if we go for the bin calculation, it would give more rating to the A Test, and it would avoid the confusion we have as to: Where did this method come from?

And ultimately, if we -- It would promote consistency because two, they're based on a bin. Maybe in five years from now we should implement that for single-speed.

MR. BROOKMAN: So, let's just pause there. Comments on these last two bullets?

Jim Crawford.

MR. CRAWFORD: Just the obvious comment on the middle bullet there that the -- Excuse me. I'm sorry. -- the last bullet, that the only reason that one would consider as a change is because you expect it's going to change some SEERs.

And so that's the same issue I mentioned a moment ago, that if we're positive doing things that is going to change the writing of existing rating equipment, that needs to be taken into consideration as to the scope of the, of the

rulemaking.

MR. BROOKMAN: Um-hum. Thank you.

Paul?

MR. DOPPEL: Paul Doppel, Mitsubishi.

The, the current way of doing the testing for variable-speed systems puts an extra burden on variable-speed manufacturers because they're required to do ten tests to calculate SEER and HSPF, as compared to the four required by those allowed to use the short-cut method.

So, we have tremendous testing burden placed on us.

MR. BROOKMAN: So, what are you suggesting the Department do with this?

MR. DOPPEL: Make it, make it the same for everybody.

MR. BROOKMAN: Just wanted to be clear best we can. Okay.

Okay, final comments on these two?

Harvey.

DR. SACHS: Harvey Sachs, AC-triple-E. Harvey Sachs, AC-triple-E, supports eliminating the shortcut method.

MR. BROOKMAN: Okay.

DR. SACHS: We do not believe that it should impact the testing, but elimination, should eliminate the shortcut method.

MR. BROOKMAN: All right. Thank you.

Yes, Jim Crawford.

MR. CRAWFORD: I would say that despite the wishes on, of, of, of some parties, variable-speed systems represent a, a, a large, excuse me, a small minority of the systems in the market today, and that situation is likely to prevail.

Being the first, or one of the first companies to have, have introduced variable-speed into the U.S. market, I think that when one does that, we have to recognize that you, you take on board certain burdens in terms of your design, in terms of your, your product features, in terms of, of testing.

More complex systems reasonably involve more complex testing.

MR. DOUGHERTY: Yes. You're trying to generate a performance map, and so as the systems

become more complex, it takes more points.

MR. ANDERSON: This is Wes, DOE.

Paul, if you could submit some information on what that burden is, or what the effect is? And I don't want to say "cost data," but some, the impact on your business, that would be helpful.

MR. BROOKMAN: I see Jeff.

MR. DOPPEL: Okay. We will do it.

And the greatest impact is in the area of testing on an annualized basis. While it's not great, but that's where it rally shows, as test requirements on an annualized basis.

MR. BROOKMAN: Jeff is the final comment.

MR. NICHOLS: Well, this slide in general, the top one, I agree with what Jim said. There, there would be an effect on SEER, and we, you know, that has to be taken into account.

The bottom, the bottom bullet, I think maintaining the short-cut method is, is probably appropriate, and it definitely has -- If you modify the, the bin, it definitely would affect SEER as

well, and the existing product would be affected.

The -- And the last one on test burden, single-stage product is different than two-stage, and their performance envelopes are different, which is different than variable.

So, I think there is a natural progression of, of testing required to map the behavior of, of the systems, and it's a, it's a reasonable expectation that, that, that there should be differences along that way.

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs.

And I'd just like to note that the document that, that shall not be named does call for the release of EER by bin for all equipment, including single-stage.

So, the data for the bin calculations are widely available, and it's really a matter of checking the spreadsheet that it actually adds up to, to the SEER.

So, I don't think this is actually a burden if, if the document that is not to be named does take effect.

MR. DOUGHERTY: Okay. So, at least --

MR. CRAWFORD: Doug? Doug?

MR. BROOKMAN: Jim, question?

MR. CRAWFORD: We talked about bins enough that I should make the observation that, that doing calculations on a bin basis probably doesn't disturb too many people.

Doing testing on a bin basis for conventional, single-speed systems would disturb a lot of people. It's a matter of the test burdens not as relates to that that is on the table.

DR. SACHS: We didn't ask for that.

MR. CRAWFORD: Humm?

DR. SACHS: We didn't ask for that.

MR. CRAWFORD: I didn't say that. Not everybody understand it as much as you do.

MR. DOUGHERTY: One omission -- And, again, there may be others, but the test you may refer to was through-the-wall air conditioners and heat pumps. In particular, there's nothing stated in case of the refrigerant line, where currently you need to have ten feet outdoors, whether or not it should have the same refrigerant tubing

requirements of 25 feet, or how to best measure the outdoor temperature, given that the, the inlet and outlet are usually right over the top of one another.

How -- What's the best place to make that measurement so you get a consistent setup from one laboratory to the next? So, that's something that, if anybody wants to comment on that, those would be welcome as well.

(Whereupon, no response was had.)

MR. DOUGHERTY: Okay, going on, then, I'm going to turn it over to Jennifer and let her talk about the scheduling and the impact on manufacturing.

MR. BROOKMAN: And as we're nearing the end of the presentation slides I'm going to hand out the Department's compilation of the business cards that were handed in so everyone's got one.

DR. SACHS: As we're doing this transition, I have one other technical question that I'd like to get on the Record.

MR. BROOKMAN: Sure. Would you want to address it to Brian?

DR. SACHS: It's addressed to Brian, but I'm not sure he'll have to respond at this point.

On Page 31230 there's a claim that EER at 115 can be linearly extrapolated from EER at 95 and 82. And I would certainly appreciate documentation of that for 410-A systems.

MR. BROOKMAN: You don't need to respond now, Brian, okay?

Okay.

Yes, Molly.

MS. TROMBLEY-McCANN: Molly Trombley-McCann.

I also had another issue I wanted brought up which has to do with the default fan power and external --

MR. BROOKMAN: Would you like to make that as a concluding comment?

MS. TROMBLEY-McCANN: Sure. I'm not attached to when I say it.

I don't want it to get lost.

MR. BROOKMAN: Don't let it get lost.

RULEMAKING SCHEDULE AND IMPACT ON MANUFACTURERS:

MS. WILLIAMSON: Okay, I'm Jennifer

Williamson with the Pacific Northwest National Laboratory. And fortunately for everyone, everything I'm going to talk about has already been covered.

First of all, written comments are due no later than August sixteenth to the Department. As we have said before, we expect the Final Rule on this test procedure to be published in 2011, and the effective dates of the changes that are proposed will come in two steps, as Brian talked about.

The non-EISA changes become effective 30 days following the publication of the Final Rule, and the Set 2 revisions will become effective on the same date as the Energy Conservation Standards.

MR. BROOKMAN: Jim Crawford.

MR. CRAWFORD: I just make the point that this is why I have several times during this morning's discussions indicated that some of the technical changes being proposed by Ryan, excuse me, Brian, will affect the performance measures.

And that being the case, a 30-day implementation lead time is totally inappropriate,

and perhaps not consistent with law.

MR. BROOKMAN: Okay. Thank you.

Jeff?

MR. NICHOLS: Twenty-eleven is a fairly broad target, and we're only six months away from that date. So, is there a, a more targeted -- you know, like a month or quarter that's targeted for this target to being realized?

MR. ANDERSON: I'm sorry, I, I didn't hear the question.

MR. NICHOLS: Is there a month or a quarter that -- Preferably in a month.

MR. BROOKMAN: In 2011, for the test procedure, is there a target date, where it just says 2011?

MR. ANDERSON: This is Wes at DOE.

Yes, we, we can't -- We, we don't -- We -- Let's -- We're going to try to make that date. That's it.

MR. NICHOLS: Is there one that you can communicate?

MR. BROOKMAN: Molly, go ahead.

No, Karim, go ahead.

DR. AMRANE: Karim Amrane, AHRI.

I mean, you have to compete to develop the air-conditioner rulemaking by June of 2011, which means that this has to happen before.

MR. ANDERSON: Correct.

DR. AMRANE: So, we're talking at less than a year at the most.

MR. DAUGHERTY: Okay, thank you, Wes.

Okay, Harvey Sachs.

DR. SACHS: With respect to --

Harvey Sachs.

With respect to Jim's concern that the so-called non-EISA revisions might affect existing equipment, Wes, how do we handle that? Is it, is it possible to set this up in such a way that existing equipment is, existing models are not impacted and do not have to be retested for these?

The new method would apply to all new equipment?

MR. ANDERSON: Yes. This is Wes, DOE.

That would be the goal. We will revisit -- We'll take his comment into consideration, and, and yours as well, and come out

with a, an answer in the, in the Final Rule.

But, the goal of DOE is not really to impact manufacturers in, adversely, so --.

MR. BROOKMAN: Okay, thank you.

Okay, let's proceed with the slides.

MS. WILLIAMSON: All right. So, we've just covered this.

When the Test Procedure Final Rule is published, it was our view that the test procedure revisions in that first group would not trigger immediate retesting or rewriting of any existing products, and also that SEER and HSPF are not triggered as a result, altered as a result of those test-procedure revisions.

MR. BROOKMAN: Jeff.

MR. NICHOLS: Just one more final comment on the 30-day comment time. Some of the non-ESAI changes are programming-type changes in, in the test cell lab environment, and, you know, probably not logistically reasonable to expect those could be executed within 30 days of the Final Rule.

It's just probably not a reality when,

unless you go higher, more resources to go do it, both privately and at third-party institutions.

MR. BROOKMAN: What time frame would you suggest would be necessary?

MR. NICHOLS: I think a minimum of 180 days is a reasonable expectation.

MR. BROOKMAN: Wow. Okay.

Okay, thank you.

MS. WILLIAMSON: All right. And then finally, when the Energy Conservation Standards become effective, any regional Standard, if promulgated, will require that additional rating of any equipment that is sold or installed in that region, and will require testing of some existing and any new units, adding coverage within the alternative reading methods.

And with that, I'm going to turn it over to Wes to finish up.

QUESTIONS & COMMENTS AND CLOSING REMARKS

MR. BROOKMAN: Yeah. Well, before Wes finishes, --

Wes, pass that down.

We wanted -- Molly's the first to raise

additional concerns, and then I go back to Jim.

MS. TROMBLEY-McCANN: Molly Trombley-McCann.

When we submitted comments during the framework phase, our comments recommended changes to both the default external static pressure and the default fan power that are used in the test procedure.

In the NOPR, the Department expressed their intent not to change either of those values. And in particular, I wanted to start with external static pressure, because -- Let me see if I can find the quote here.

The Department essentially stated that there was not data available to justify a change in external static pressure. However, there's no data available to justify the current external static pressure.

It's a value been in place since 1980, and there's no justification whether or not that is appropriate at this time. There is some data, and we did submit that, to supplement higher value, particularly in hot dry region.

So, my example, I think, goes to the Department, is: Why choose a value that has no backup data, as opposed to some that has at least some to justify it?

And what data would you need to see to feel comfortable changing the external static default value?

MR. BROOKMAN: Okay. Thank you.

Jim Crawford.

MR. CRAWFORD: I'm going to defer for a moment. I think that if someone's going to answer that, they ought to.

MR. BROOKMAN: I don't think the Department wants to answer that one now.

MR. CRAWFORD: I thought -- Well, I thought the Department answered it in the Notice.

MR. ANDERSON: Yeah.

MR. CRAWFORD: Not to the satisfaction of some Parties, but I thought they answered it.

The -- Okay. Yeah.

The, the point on the, the preceding chart was that the light rating will be required for equipment sold and installed in the hot dry

region. I think that, that this assumes that there is such a thing as a hot-dry air conditioner.

And it's been ably demonstrated repeatedly that that is a misconception. And the recently funded project on that demonstrated what I've just said.

If you really look at it objectively, the, the products of this industry are national products. It's unlikely that there will be three different sets of products for different regions.

And so recognize that, that if you impose testing for a hot-dry region, you impose that testing on every product in the industry.

MR. BROOKMAN: Okay. Thank you.

Yes, Karim.

DR. AMRANE: I guess I wanted to follow up on, on what Molly said about the static pressure. I think I agree with the Department's determination here with respect to the static pressure; that we, that we are, by establishing such a criteria, I think there is evidence that we can design to static pressure, we can design ducts to static pressure.

The question is: Why are they not designed that way? So, I think instead of focusing on this test procedure, I think the focus should be on designing better ducts.

MR. BROOKMAN: Paul?

MR. DOPPEL: Item Number 6 on Page 34122 references Mitsubishi's comments from the previous meeting. And the, the issue there is that we're saying that the current test method does not accurately incorporate the energy-saving capabilities of the VRF systems, or I should say variable-speed systems.

And the one thing I wanted to bring out in regard to that, I know you're asking for more additional information for another testing method, and I've been working with the R-factor in Japan to try to come up with something.

But, basically what happens is the system's intended for all the measurements to force the compressor to change speeds in order to accommodate for the loads.

What the test procedure does is freezes that which is supposed to be floating to match the

loads to try to contort the system to operate at the certain level. And that creates a lot of inefficiencies in how the system not only operates, but how long the testing takes.

It requires a lot longer for the systems to stabilize once you fix those conditions. So, that's, that was the intent of our comments there, and that, there, there just needs to be a better way of testing those systems.

And, again, we're still working with our folks in Japan to do that.

Then I just also wanted to reiterate that, the fact that for the multi-split systems there should not be a requirement to turn your indoor system off during operations where the compressors are operating at their minimum speed.

MR. BROOKMAN: Okay.

So, Molly.

MS. TROMBLEY-McCANN: Molly Trombley-McCann.

So, this question has to do with default fan power, and it ties into the furnace fan test procedure rulemaking that is just beginning. And I

believe the public meeting is next Friday for that.

And my question is: How is the Department going to reconcile what happens in that test procedure rulemaking with what's happening in this test procedure rulemaking?

Because it seems to me that once those test procedures go into effect, every fan will have to have that. And the option of using default power when every fan has an actual tested capability doesn't make sense.

I don't know how they're going to line up, but they obviously line up with each other. And I'm wondering what the Department's planning to do to manage that.

MR. ANDERSON: This is Wes at DOE.

The way we see it, the furnace fan rule, I think it publishes in 2013.

MS. TROMBLEY-McCANN: That's the deadline; yeah.

MR. ANDERSON: Yeah, that's the deadline, for 2013. And then the effective date is some years after that.

So, we're using our, our rulemaking

schedule to, to handle -- That's a, a secondary as far as air conditioner's concerned. I know it's a very large impact to air conditioners, but we look at that as another step in the process.

But, it's -- But, because it's been set up as a furnace fan rule, we have to work with it at, on this schedule. So, I believe that's not a direct answer for you, but we're kind of stuck here with this.

MR. BROOKMAN: Harvey Sachs.

DR. SACHS: Harvey Sachs, and I want to commend Karim for his observation that it's possible to design and install a lowest P duct system.

On the other hand, what we know is that even in good times for construction, the vast majority of central air conditioners today are sold for existing houses.

The wet fit cost for putting in one of these very lowest-P duct systems is prohibitive in an existing house. Therefore, the existing market will remain dominated by systems that have high fan power and highest P.

The ratings that DOE uses are, were the best guesses that could be made by this industry in the 1980s. I've not been able to find data on which they were based.

They do not have data, not adequate, not well-distributed across all duct-type installations, but we know enough today that to insist on using a 30-year-old guess instead of a data set seems to be perverse in terms of this legislation.

MR. BROOKMAN: Okay. Thank you.

So, this is the occasion for anybody that wishes to make additional, or, and perhaps final comments.

(Whereupon, no response was had.)

MR. BROOKMAN: Okay. So, then do you want to put the last slide up there?

MR. ANDERSON: Yeah, sure.

MR. BROOKMAN: So, from my perspective, I'm turning it back to Wes. And I thank all of you.

We've covered a lot of ground in this meeting, some of it really technical. You've all

hunched in there, and best wishes.

We'll see you soon.

SUMMARY AND NEXT STEPS

MR. ANDERSON: Yeah. This is Wes of Department of Energy, Wes Anderson, Department of Energy.

In summary I'm going to reiterate: The comment period ends on the sixteenth of August.

You made some great comments here. Please, some of them were statements, but please back up those statements with, or with data or explanation as to how you came to your conclusions.

And use the three bulleted points here as, so we know how, when, when the information comes to us, we know where to send it. You can also submit your comments to -- Oh, I'm sorry. -- our web page, where we'll put up the latest edition of the presentation as soon as possible, as soon as we can get it to the web mavens.

Well, preferably early next week will be the, it will be up there, up there by then. And also as a final statement, the Consensus Agreement is being considered by DOE, all facets of the

Consensus Agreement.

Thank you.

The next milestone is the NOPR for the Standards rulemaking, which will be for sometime in the fall. The test procedure will continue to progress concurrent with that, and it is DOE's goal not to burden anyone with this test procedure, so it will be, it will be out in time for this won't be impactful for anyone.

Questions?

Harvey?

MR. BROOKMAN: Thank you for your patience, everyone.

MR. ANDERSON: All right. I officially close these proceedings.

MR. BROOKMAN: Thank you.

(Whereupon, at 12:58 p.m. ET, the above Public Meeting was concluded.)

I certify the foregoing to be a true transcript from my notes.

E-signature: D. I. Bunn

CSR CP RPR

CERTIFICATION

I, D. I. Bunn, a Registered Professional Reporter, Certified Conference Reporter, and Notary Public, do hereby certify that the foregoing public meeting was duly taken and reduced to writing before me at the place and time therein mentioned. I further certify that I am neither related to any of the parties by blood or marriage, nor do I have any interest in the outcome of the above matter.

In witness whereof, I have hereunto set my hand and affixed my official seal, at Lusk, Wyoming, USA, this 14th day of June, 2010.

E-signature: D. I. Bunn

Notary Public

My Commission expires January 5, 2012.