TRANSCRIPT OF PROCEEDINGS

IN THE MATTER OF:)
)
TEST PROCEDURES FOR)
RESIDENTIAL AND CERTAIN)
COMMERCIAL WATER HEATERS)
CONVERSION FACTORS)
RULEMAKING MEETING)

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BEFORE THE U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY & RELIABLE ENERGY

IN THE MATTER OF:	)
	)
TEST PROCEDURES FOR	)
RESIDENTIAL AND CERTAIN	)
COMMERCIAL WATER HEATERS	)
CONVERSION FACTORS	)
RULEMAKING MEETING	)

7th Floor, Room 7140
OHA Conference Room
Department of Energy
950 L'Enfant Plaza
Washington, D.C.

Thursday,
May 28, 2015

The parties met, pursuant to the notice, at 10:04 a.m.

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LAURA BARHYDT

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JIM LUTZ (Via Telephone)

Also Present:

DOUG BROOKMAN
Public Solutions, Inc.

P R O C E E D I N G S

(10:04 a.m.)

MR. BROOKMAN: Okay. Let's start. Good morning, everyone. Welcome.

MALE VOICE: Good morning.

MR. BROOKMAN: This is the public hearing on conversion factor for consumer and commercial water heaters. Today is May 28, 2015, here in a building adjacent to Forrestal Building in Washington, D.C. Glad to see you here this morning. Would you like to make welcoming remarks?

MS. ARMSTRONG: Sure. Hi.

MR. BROOKMAN: We're going to start with welcoming remarks from Ashley Armstrong as she finds a microphone to do that.

MS. ARMSTRONG: I'm trying to figure out how to work this thing. I'm Ashley for those that don't know me. I'm working on it. I'm making my way there.

So I'd just like to welcome everyone to the public meeting, apparently the really popular public meeting, for the conversion factor rule. We put together some slides that are just high-level summary slides of our proposed rule, but really this public meeting is all about you guys. You guys requested it, so we're here to listen to anything that you guys want

to bring to our attention, any data, any information you want to share, any concerns to help inform our next steps of the rulemaking. So we do appreciate that all of you traveled here especially on such short notice, and we look forward to such a great discussion today.

MR. BROOKMAN: Thank you. Let's start with introductions as we always do. I'll start to my immediate left, and I think these microphones, which we've spread across this conference table and I think in the back there we're not going to be able to do so well.

FEMALE VOICE: Okay. I'll --

MR. BROOKMAN: We'll see what we do.

FEMALE VOICE: Yeah. Should we put the yellers in the back?

MR. BROOKMAN: Start right here with Steve.

Mr. ROSENSTOCK: Steve Rosenstock, Edison Electric Institute.

MR. STANONIK: Frank Stanonik, Air-Conditioning, Heating, Refrigeration Institute.

MR. STEPHENS: Charlie Stephens, Northwest Energy Efficiency Alliance.

MR. YORK: James York, Rinnai American Corporation.

MR. BOROS: Joe Boros with Rheem Manufacturing Company.

MR. MYERS: Frank Myers, PVI Industries.

MR. SACHS: Harvey Sachs, American Council for an Energy Efficient Economy.

MR. PATE: Russell Pate, Rheem Manufacturing Company.

MS. MEYERS: Karen Meyers, Rheem.

MR. KOVALENKO: Alex Kovalenko, HTP.

MR. ADAMS: Charlie Adams, A.O. Smith Corporation.

MR. STAS: Eric Stas, DOE.

MS. BARHYDT: Laura Barhydt, DOE.

MS. ARMSTRONG: Ashley Armstrong, DOE.

MR. BROOKMAN: Let's go over here, please.

MR. PHILLIPS: James Phillips, Navigant.

MR. DARLINGTON: Adam Darlington, Navigant.

MR. HEALY: Bill Healy, NIST.

MS. DAVIDSON-HOOD: Caroline Davidson-Hood, AHRI.

MS. SHEPHERD: Amy Shepherd, AHRI.

MR. CARNEVALE: Bruce Carnevale, Bradford White Corporation.

MR. TAYLOR: Mark Taylor, Bradford White Corporation.

MR. SANBORN: Chad Sanborn, Bradford White Corporation.

MR. OLSEN: Adam Olsen, Bradford White.

MR. YILMAZ: Aykut Yilmaz, AHRI.

MR. BROOKMAN: Great. Thanks to all of you. Nice to see you here this morning. Thanks for being here.

All of you received a packet of information I hope, and if you look at page 7 of this packet, you'll see a truncated meeting agenda. We're going to talk first about regulatory history and then move from there to a rulemaking overview, move from there to a description of issues addressed in the NOPR, and then closing remarks.

Many of you I think are familiar with the general format for these meetings. This packet helps to guide the discussion, although, as Ashley said, we hope to elicit a lot of comment wherever it fits best in the content provided here to hear from all of you today.

I'd ask for your consideration of a few simple ground rules. If you'd speak one at a time, say your name for the record each time you speak. There will be a complete transcript of this meeting made available. If you could be concise to share the

air time, keep the focus here. If you haven't turned your cell phones on silent mode, please do so.

And webinar participants, we welcome you. The Department of Energy is trying to make these meetings accessible to all. Please keep your phone on mute and raise your hand to be recognized to speak and then we'll try and see if we can work you into the conversation here in the room.

So far as we know, the audio and everything is working okay, right?

THE COURT REPORTER: Yes, sir. I hear you all.

MR. BROOKMAN: Okay. Great. What about the back row?

THE COURT REPORTER: They're very faint.

MR. BROOKMAN: Okay. We'll see what we can do about that.

THE COURT REPORTER: I have a mic at the podium, so if they -- I mean, I know it's inconvenient, but if you wouldn't mind --

MR. BROOKMAN: Okay.

THE COURT REPORTER: -- going there, that would be great.

MR. BROOKMAN: Okay. So do you want to start with the content?

MS. ARMSTRONG: Sure. So just to go through a couple of these, many of you have been to our public meetings before, but kind of how this works, we're here today to talk about the crosswalk and the proposed conversions that we had in our notice of proposed rulemaking. We're here to seek your feedback and obviously discuss next steps. You may see issues boxes throughout. Some of them correspond to those that you will see in the NOPR itself. Obviously we welcome comments on any of it, so you shouldn't feel like you need to just comment on those specific items. The comment period closes on June 15, after we already extended it once.

So at this time we're going to open it up in case certain people want to make opening remarks before we start into our content, or if they don't we can jump right in. Up to you guys.

MR. BROOKMAN: Frank Stanonik?

MR. STANONIK: Frank Stanonik, AHRI. Yeah. Since this meeting is maybe a little bit different than normal ones, we actually kind of prepared actually quite extensive opening remarks that kind of try to give an overview of what we see as in fact why we asked for the meeting and major issues. I've actually got it as a PowerPoint.

MS. ARMSTRONG: Okay.

MR. STANONIK: If you want, we can load it onto the computer --

MS. ARMSTRONG: Help, please.

MR. STANONIK: -- and I can try and go through it quickly. Not wanting to hijack the meeting, we're going to raise a number of issues and maybe --

MS. ARMSTRONG: Do you want to go stand up there?

MR. STANONIK: I can stand up there, yeah.

MS. ARMSTRONG: Or you can sit there, whatever you want, but this is going to be how you --

MR. STANONIK: Okay. Well, let me -- I'll do it sitting down.

MS. ARMSTRONG: Frank, do you want to go through their presentation first and then do yours or --

MR. STANONIK: Well, I was thinking we'd go through ours and then as we -- you know, we're going to identify questions and issues, and I'm sure as you go through yours we can then address them. But I think as kind of an opening remark I'd rather -- and hopefully not take up too much time, but just kind of give you an overview.

MR. BROOKMAN: If you've got a significant number of comments, let's hear them now.

MR. STANONIK: Okay.

MR. BROOKMAN: Yeah.

MR. SACHS: Mr. Facilitator, this is Harvey Sachs. I yield our time.

(Laughter.)

MR. BROOKMAN: I'm going to remember that, Harvey.

MR. STANONIK: Ignore any files that say FIFA bribes.

(Laughter.)

MS. ARMSTRONG: Frank.

MR. STANONIK: It should be the very last one on the list there. No. It is -- I'm sorry -- DOE Con Factor Notes For Meeting, halfway up.

MS. ARMSTRONG: Halfway up.

MR. STANONIK: Right there.

MS. ARMSTRONG: Got it.

MR. SACHS: Frank, this is Harvey. Will these be distributed to the group?

MR. STANONIK: Actually, since I don't want to take them back, anybody who wants can have a printed copy.

MS. ARMSTRONG: Yeah. They'll go in the

docket.

MR. STANONIK: All right. So like I say, I'll just try and go through the issues and recognize that as we ask questions I will agree that we can discuss them as they come up later. Otherwise we'll mess up your agenda terribly.

All right. So just kind of overall issues, and some of you may not be aware, since the NOPR came out and actually before we have been running tests in our certification program and our members have been running tests. So we did send some data in to DOE on May 14 I believe it is, so some of this is also going to be reflecting what we believe we're seeing in the data.

So basically I'll tell you our overall concerns are that, all right, so the UEF conversion allows most current models to comply with what are proposed as the UEF minimums, but when we look at the measured values we get, some of those measured values don't align with the converted values and would suggest the model is not going to -- that the model test results in the minimum are not let's say in agreement and so potentially the model becomes noncompliant.

And we see in our results at least that for

some of the minimums in fact it is not a neutral no change in the standard, and two examples of that in products that are fairly significant in the market, for almost all of the electric resistance storage water heaters, any draw pattern, the measured UEF seems to be coming out consistently lower than what the conversion factor equation says it should be.

And the consequence of that is that the converted standard from our perspective now is more stringent than the current standard. That's for residential electric resistance. In the case of residential gas, the models -- and this actually goes the other way in the case the models did.

In the high usage bin, we're seeing that a majority of the results, the measured UEF is higher than the converted UEF, and in this case they would be above what is the minimum standard, so actually in that case we're concerned. I mean, obviously the whole idea is the conversion is supposed to be neutral. We're concerned it's actually a relaxation of the standard when you apply it to high usage gas products.

MR. STEPHENS: Frank, I have a question --

MR. STANONIK: Yes?

MR. STEPHENS: -- about that. This is

Charlie Stephens. Are the three-quarters of gas storage models that have UEF greater, are they ones that say most of them meet the standard now or minimally meet the EF standard now, or are they all exceeded anyway?

MR. STANONIK: Well, it's a mixed bag.

MR. STEPHENS: Okay.

MR. STANONIK: It's a mixed bag. I mean, first of all, we were only testing, with very rare exception, we were only testing models that complied with the standard that went into effect in April.

MR. STEPHENS: Close to a minimum compliance or --

MR. STANONIK: Well, no. We've got some over. We've got some over. And, Charlie, at the back you actually will have, it's probably not going to show up very well, but you have our table of results.

MR. STEPHENS: Oh, okay.

MR. STANONIK: So, you know, that's a majority of our tested ones.

MR. STEPHENS: Okay.

MR. STANONIK: So then again this is, you know, just trying to really lay it out here. Our concern is the NOPR really is not making the transition from EF to UEF possible. We're seeing

distinct differences between the EF and converted UEF values that really are not let's say consistent where, you know, you could just see the pattern, if you will.

And then the trend seems to demonstrate that there's a marked shift from the UEF converted calculation, if you will, to the UEF tested value for several types of water heaters. And then the last point here is that, again, you know, as it's very clear in the statute, DOE is obliged to determine the new standard that reflects the new test procedure and no change in stringency.

As we see this, the NOPR is not doing that. We think in some cases, as I pointed out, the proposed converted standard may be more stringent. In one example, it's actually less stringent. So, again, this is just kind of laying out some of the issues we've seen in the DOE analysis.

One of the things is equation for Q. That's the estimated total consumption of a water heater. It shows up on two pages, and I'm pretty sure it was derived from the WHAM work, but in that equation the standby loss is calculated as if it occurred for 24 hours, and when you're talking about fossil fuel products you've got to factor out the amount of burner on time. When the burner is on, the loss that

otherwise would occur through the flue tubes and out when the burner is on, the transfer is going the other way, so that period of time that potential surface of loss is in effect the opposite. It's really the heat exchanger. So, you know, that will change some of the derived results I think.

MR. SACHS: Frank?

MR. STANONIK: Yes?

MR. SACHS: Excuse me. This is Harvey. As we go through, can you give us a sense of things like whether the variances are normal or biased in one direction and sort of the little things like this? Are these factors 1 percent or 10 percent, that estimate of which things are big and which aren't?

MR. STANONIK: At this point I couldn't give you the magnitude, but that is going to overestimate the consumption.

MR. SACHS: Okay. Thank you.

MR. STANONIK: Yeah. Probably, probably for a smaller tank size, a lower input product, the effect is going to be greater. You could have a burner on time that would approach two hours. On let's say a residential duty commercial product, your burner on time, probably an hour, maybe even a little bit less, so yeah.

So then just again other questions. There's an analysis. You show the constants for all the A, B, C, D that are used in the, I think it's the WHAM calculation or one of the calculations, and there's really no explanation where those numbers came from and we just don't -- we've just got a question about that.

We don't think you need separate conversion factors for what has been described as standard and low NOx gas water heaters. You do need one for the ultra low NOx. It's a totally different burner, a different design, but we really question whether we need this extra complication.

This is one that was let's just say we are scratching our heads. In Table III.21, which is the information on the residential duty commercial water heaters that were evaluated or were tested in this analysis, three out of the seven don't fit the definition of residential duty water heater. They're inputs less than 75,000, and in fact none of them are tested for more than 80,000 and the volumes were generally I think 75 gallons or so, but the main thing is they actually in terms of their input and volume parameter would have fit as a plain old residential storage water heater, and yet they were tested for the

conversion factor for residential duty.

This is really a major one. We just don't think there's been enough models tested to reflect a cross-section of residential duty water heaters that are covered by this test procedure. We think there should have been some more short units tested. We think there's an issue that if you look at higher efficiency heat pumps the conversion really doesn't fit. We think there should have been more residential duty commercial gas products tested, including some with inputs up around 105,000, 100,000. And then we just think, you know, when you look at the gas products, there should have been maybe a better mix of input volume size and venting type, and that would really -- well, that's primarily storage, but maybe a little bit on the tankless instantaneous products.

We've also identified two products we think should have been addressed and weren't. One of our members has advised us they do have residential duty electric instantaneous water heaters that fit the definition in the test procedure and so they will need a conversion factor.

And then there is -- well, I guess I'll say there were. There were electric storage water heaters that had inputs less than 12 kW and had what I call a

180 F thermostat. In the old DOE test procedure, those products weren't tested because they had that high, high temperature thermostat, and yet under the current definition those actually now would be included as residential storage water heaters, electric storage water heaters, and they really weren't evaluated I think. And so maybe that's another issue is in the unit that we looked at would be to look at models in fact that do have a higher thermostat, although -- whatever.

And then just as a general question, well, basically, as we analyzed this, has DOE looked at the basic repeatability of the uniform efficiency descriptor test procedure? And, you know, I think that's useful information for all of us. I mean, we're doing the same thing. We're running a single test old EF procedure, new UEF procedure, but I think in terms of really trying to sort that out we need a better sense of what is the repeatability of the UED test procedure.

And then again in Table III.5 there is a determination of N, which is the number of -- I remember the number of times a tankless product actually heats up and cools down completely or it's the number of cycles. I forget which. But in any

case, we're concerned that in the current test procedure, if you have a product that is multi-firing, you run half the cycles at the low fire, and we don't think that that determination of N really factored that in, nor did it perhaps recognize that in some cases, if the design can't make it, you would run the flow rate at a lower than specified value because the unit can't hit the target. That may be less of an issue when the output is 125.

And then these will be admittedly probably repetitive for some people, but we think there's really big implementation issues, and the primary one is, as the NOPR notes, what's being proposed is that for certification reports filed after July 13, and I've inserted in there until May 1 because on May 1, 2016, reports have to be filed for all models on the market at that time.

So only for new certification reports filed after July -- or I'm sorry. Any certification report filed between that period will include both EF and the UEF or the thermal efficiency and standby loss and UEF if it's a residential duty. And then it also indicates that there are no changes to the FTC energy guide label information at this time, and that won't change until FTC changes its regulations.

So we're understanding that at the moment potentially on July 14 you would have a UED test procedure in effect, and the FTC energy guide label will still be based on information derived from the now old EF test procedure. And as we go through, hopefully I just want to just make sure we understand DOE's approach to that.

And then we really don't see how this rulemaking is going to be finalized by July 13, and so this raises questions about if it's not finalized by July 13 and a manufacturer wants to advertise his efficiency ratings in literature, his own product descriptions and whatever else, how will the manufacturer determine the UEF rating, which he will be obligated to display we believe?

And then likewise, without that conversion factor, how can the federal minimum standards be translated to a minimum UEF requirement, and then the last part of this is okay, so if a new model is introduced after mid-July and the standard in effect is still the EF standard, how are they going to certify that they comply with that standard if the operative test procedure is a UED test procedure on July 13?

And then my favorite one is grandfathering.

In a number of places in the NOPR DOE confirms their intent that products currently complying with the minimum efficiency standard will not fail to comply where the standard minimum conversion factor has been applied. In a number of these citations DOE talks about units complying with minimum standards, and so what is not clear to us anyhow is so I have a model that is complying today with the existing minimum standard that went into effect on April 15.

Are the units of that model manufactured after July 13 also considered to comply with the converted UEF standard? And that would be what we believe is classic grandfathering, as happened back in the 1990s. If the answer to that is no, we need to understand how DOE got to that conclusion because clearly we don't agree.

And then the other one which again matters significantly is in this analysis the converted. proposed converted formulas talk about using rated volume. We just really want to make sure what rated volume values were used in the analysis. Did they use the current name plate rated volume of 30, 40, 50 gallons or whatever?

And if they didn't, it really needs to be redone because, as we've pointed out, if you use the

rated volume as defined in the UED test procedure and actually repeated in this NOPR, that change on a practical basis does increase the stringency of the current federal standards for some products and that's really not allowed by the law.

And then this gets to the point, you know, we've put in a petition to have DOE reconsider this. That was published. I know for a fact that the comments were overwhelmingly supportive of ours from many different stakeholders, and we need to know what's going on with that petition. We believe it needs to be resolved before this rule can be finalized.

And maybe at this point again I don't really want to -- I'm not intending to hijack the meeting here. We can maybe stop here and when we get into some of the test data we can cover this. So let me suggest that.

MR. BROOKMAN: How many more slides do you have?

MR. STANONIK: When we get to this --

MALE VOICE: Six.

MR. STANONIK: -- one, two, three, four -- six with the tables, yeah.

MR. BROOKMAN: I'm just thinking about

switching back and forth between these two.

MS. ARMSTRONG: I would wait and do it at the end.

MR. BROOKMAN: Do it at the end?

MS. ARMSTRONG: Yeah.

MR. STANONIK: Okay.

MR. BROOKMAN: Okay. So let me see if we have additional opening remarks here at the outset. And thank you, Frank, for --

MR. STANONIK: Thank you.

MR. BROOKMAN: For all of that. Steve Rosenstock?

MR. ROSENSTOCK: Steve Rosenstock, Edison Electric Institute. I'm going to go, and I appreciate all the information that was just presented, but actually I have a different question. I already filed some comments. And it's really about, it's kind of a process issue because in this NOPR that talked about test procedures there are energy conservation standards for residential duty commercial water heaters. So, as I was looking at it, I was kind of surprised to see an energy conservation standard in a test procedure NOPR, but I guess one question I had, and I'm sure that it was answered, but was when did these standards take effect?

And the reason I'm asking that is I had never seen this definition of a water heater before, and I'm not sure if this is a reclassification or a brand new product that DOE has never regulated. Again, I'm not in the water heating industry. I just try to follow the issue. So, if it's a new product that DOE has never regulated, typically manufacturers get three to five years to comply with the standard. The way it looks in the NOPR is that it takes effect immediately. There is no lead time for the manufacturers.

Now again, it could be that these are exactly what they're doing now in terms of under their current status as a "commercial water heater", but again, in terms of just again as kind of a third party just seeing this, it just seems like all of a sudden it's a new product with a new definition with a new energy efficiency, an energy conservation standard, and it just surprised me that there was no lead time whatsoever.

So, again, I'm sure -- I hope to be corrected. We already filed comments to that, but again it's more of a process issue. Is it a reclassification or is it --

MS. ARMSTRONG: Yes.

MR. ROSENSTOCK: -- a new product?
MS. ARMSTRONG: It's not a new product.
MR. ROSENSTOCK: What?
MS. ARMSTRONG: It's not a new product.
MR. ROSENSTOCK: Okay.
MS. ARMSTRONG: It's a reclassification. You're talking about light duty? Is that the issue?
MR. ROSENSTOCK: No. Residential duty commercial water heaters.
MS. ARMSTRONG: Right.
MR. BROOKMAN: Ashley Armstrong.
MS. ARMSTRONG: This is Ashley from DOE. What we did, and you guys can feel free to chime in at will if you'd like, but what we did when we did the uniform efficiency descriptor test method was we created a new method of tests for a sliver of the now regulated commercial market that is tested. It's defined and tested in accordance with the uniform efficiency descriptor test procedure, but it's still regulated under the commercial section in our regulations. So we're translating this new method and new descriptor using the conversion factor analysis for already regulated products I think is the best way to say it.
MR. YORK: Yeah. You're just shifting the

test procedures.

MS. ARMSTRONG: There's no new --

MALE VOICE: Right.

MS. ARMSTRONG: It's just there's a portion of the commercial market that has shifted to be tested similarly to what I would say consumer models, and that shift results in a change in descriptor for already regulated products that meet that definition. The definition was established in the test procedure rule, and all the dates and associated requirements were established by statute.

MR. ROSENSTOCK: Okay. Thank you for that clarification. It was not clear when I read the NOPR. Thank you.

MS. ARMSTRONG: Yeah. It's probably more clear if you read the test procedure, which was --

MR. BROOKMAN: Charlie?

MS. ARMSTRONG: -- finished a year ago.

MR. ADAMS: Charlie Adams, A.O. Smith. Yeah. I'll just pile on. The residential duty commercial does have a minimum efficiency performance standard in effect today. It's just being translated by a conversion factor of thermal efficiency and standby loss to the new uniform descriptor, so it's changing the yardstick by which we measure something

that's already measured.

MR. ROSENSTOCK: Okay. Thank you. And again, it was just the fact that, you know, it said test procedure and then it came in with the new standard, so that also added to my confusion there, so thank you.

MR. BROOKMAN: Thank you, Steve. Additional opening remarks here or comments here at the outset before we dive into the detailed content?

MR. SACHS: This is Harvey, and I would like to just remind all of us that much of this is about requirements that come out of AEMTCA, which was based on pretty broad stakeholder agreement a few years ago, so I hope there are relatively few surprises except for the issues specifically addressed in this public meeting.

MR. BROOKMAN: Okay. Thank you.

Final comments? We're about to go to the content in the slides.

MS. ARMSTRONG: We have a couple people that walked in late.

MR. BROOKMAN: Yes. Those of you who did not get a chance to introduce yourselves, please do so.

MR. KOGLER: Yes. Nate Kogler with the

Bradley Corporation. We are the owner of Keltech.

MS. GUARD: Misty Guard with Bradley Corporation.

MR. NEWSOME: Hampton Newsome, Federal Trade Commission.

MR. McNUTT: Thomas McNutt with AHRI.

MR. BROOKMAN: Thank you.

MS. ARMSTRONG: So does anybody care if I present from here, because otherwise I'm going to be walking in front of you constantly. Is that okay?

MALE VOICE: Sure.

MALE VOICE: Yes.

MS. ARMSTRONG: We'll let Bill go over there when he's talking about fancy equations.

So just to talk about the history kind of how we got here, and actually, Harvey, you just reminded us all pretty well how we got here, but as you know, the statute provides us with the authority to establish not only standards but also test procedures for residential water heaters, for consumer water heaters and commercial water heaters.

Subsequent amendments in the American Energy and Manufacturing and Technical Corrections Act in 2012 amended the statute to require DOE to establish a uniform energy efficiency descriptor with the

accompany test method, and then once that is established it also established a set of guidelines for transitioning to that new method of test and that new metric. So that's what we're here to talk about today.

So this is just some of the history of kind of how we got here. The most relevant portion is that in July of 2014 of last year we actually published the final rule of the uniform efficiency descriptor test method. As we said, that's applicable to all consumer or almost all consumer water heaters as you know them today, as well as a sliver of the commercial market, which Steve referred to in his opening remarks.

So just some steps in the rulemaking process. The comment period closes on June 15. That's after we have already responded to a request for an extension, so as you know and we are holding the public meeting today, so there's about two weeks, a little over two weeks to file comments after this public meeting.

So I'm going to talk about the purpose, what we were trying to do with the conversion factor. We were trying to provide a method for converting existing ratings where applicable, so there are some bounds that are spelled out in the NOPR about how the

conversion factor can apply, but it's supposed to provide a method for a limited amount of time to convert ratings in lieu of retesting everything all at once.

It's also to provide a method to convert the April 2015 standards that just came in to new equations under the new metric. And then, as you have already noticed, we only develop conversions for categories of equipment that are subject to standards today and where commercially available units actually exist.

So I do want to highlight this is a table in the preamble of the actual proposed rule, and I think it's a pretty important table in my opinion. What it does is give you a high-level summary of some of the requirements and key dates in what I would call a non-lawyerfied fashion.

MALE VOICE: No offense.

FEMALE VOICE: None taken.

MS. ARMSTRONG: So test procedure effective date comes in July 13, 2015, of this year, so what does that really mean? For new basic models introduced into commerce on or after July 2015, manufacturers must begin testing and representing efficiency using the UEF metric pursuant to the UEF

test procedure and sampling plan.

There are a couple provisions in the July 2014 test procedure final rule that do allow for the use of an AEDM in limited cases. That AEDM should also be based upon the UEF test procedure. So this is new models. New models introduced after that date have to be tested. There's no conversion.

Conversion factor effective date, so date of publication of the conversion factor final rule in the *Federal Register* for basic models certified using the EF metric or thermal efficiency and/or standby loss metrics prior to July 13, 2015.

So, if you have a currently existing model that's already certified with the Department under one of those metrics and under one of those regulatory schemes, manufacturers must transition all of their representations to UEF either by applying the conversion factor equations as established by the final rule or by using the UEF test procedure and sampling plan or once again an AEDM that is based on the UEF test procedure as applicable.

So basically once we finalize the final rule, date of publication is the effective date. That's when your one year starts. For previously certified models, not new models, they must begin

using this conversion factor and transitioning, or at your discretion you can also use the UEF test procedure.

Conversion factor ending date. Ending one year after the publication of the conversion factor final rule, all basic models must be tested in terms of UEF using the UEF test procedure and sampling plan or an AEDM that was based on the UEF test procedure where allowed. After that one-year point everything is based on testing. Everything must be tested and recertified based on that testing. Okay?

MS. SHEPHERD: Ashley, I have a question. So that says all representations in UEF, so that means although you can certify to the Department EF and UEF, your representations can't have anything about EF?

MS. ARMSTRONG: So I don't think we addressed that specifically, but we can address that in our comments.

MR. BROOKMAN: Charlie Stephens?

MR. STEPHENS: Charlie Stephens. Quick question. That means as I read this that something on the order of 14 months from now the conversion factor expires?

MS. ARMSTRONG: Correct.

MR. STEPHENS: And everything has to have

been tested --

MS. ARMSTRONG: Correct.

MR. STEPHENS: -- for recertification by that time?

MS. ARMSTRONG: Correct. So the conversion factor is really a one-year thing.

MR. BROOKMAN: Karen?

MR. STEPHENS: Okay.

MS. MEYERS: So Karen Meyers with Rheem. So the conversion factor NOPR is essentially establishing the values with which you have to test to beginning July 13, is that correct?

MS. ARMSTRONG: No.

MALE VOICE: The testing methods.

MS. ARMSTRONG: You're asking the standards, right?

MS. MEYERS: Right. So my issue is we have to test to the new UEF beginning July 13, but I don't know what value it is I have to hit until the conversion factor NOPR is finalized.

MS. ARMSTRONG: Right. Which is why there's some urgency in finalizing this rule.

MS. MEYERS: Correct. And if, you know, comments are not due until June 15, I mean, it seems to me that this July 13 date is --

MS. ARMSTRONG: Have some faith.

MS. MEYERS: Is, you know -- well, okay. Is not a possible date.

(Laughter.)

MS. MEYERS: I'm telling you it's not a possible date because it's not just the testing, but it's all the labeling and marking and everything else and, you know --

MS. ARMSTRONG: So July 13 is the date for the effective date test procedure right now. I mean, at the very least that date has been out for a year or almost a year and that is when new model testing -- if you introduce a new model on or after July 13, you need to be using the UED test procedure.

MS. MEYERS: But the issue is I don't --

MS. ARMSTRONG: I get the downstream issues.

MS. MEYERS: -- know what I have to hit.

MS. ARMSTRONG: So I get the downstream issues, and Frank pretty much highlighted them all in his opening remarks, and we understand the complex position both the Department and industry are in together, and there are some practical things to work through. But just as a matter of what's required, simply speaking, new models, if you introduce them into commerce on July 13, 2015, you need to test.

That is unaffected right now by anything that's in the conversion factor final rule.

Now there are some practical issues that go along that that we understand your comments and that we will need to be addressing, but that final rule -- that date is established by statute.

MR. BROOKMAN: Charlie?

MR. ADAMS: Charlie Adams, A.O. Smith. I agree with Karen on the practical issues of literature and all of that, but the big practical issue is more than a practical issue. On July 14, I have a new model that I'm going to test. How do I know if I comply with the new --

MS. ARMSTRONG: Right.

MR. ADAMS: -- minimum standard or not because I don't know what the new minimum standard is unless I have a conversion factor to convert it?

MS. ARMSTRONG: Understand.

MR. ADAMS: That's more than a downstream problem I think.

MS. ARMSTRONG: Okay.

MR. ADAMS: That's I've got test data and I don't know if I've passed or failed anything.

MR. BROOKMAN: Okay. Thanks, Charlie.

So this table is really important.

Additional comments, questions related to this table? Yes, please? And say your name.

MR. CARNEVALE: Bruce Carnevale, Bradford White. Thank you for that clarification. That helps a lot, answers some of the questions that we've been asking, but it seems to be contrary to some of the opening statements in the summary of the NOPR where it says compliance with the amended test procedure is required beginning on the latter of one year after the publication of the final rule that establishes the mathematical conversion factor or December 31.

That seems to imply that nothing with respect to the test procedure takes effect until the conversion factor is completed, and that seems to be very much different from what's up here.

MS. ARMSTRONG: So that kicks in with the bottom row here, Bruce. It has to do with the transition for all models is on that last date. New models, the transition is earlier. Converted models, those that are allowed to use the conversion, which are existing models that have already been certified to EF and thermal or standby, they are allowed what I would call a one-year transition. That one-year transition begins on the date of the final rule and will end one year later.

MR. CARNEVALE: Okay.

MS. ARMSTRONG: And that transition allows you to use the conversion factors until you've had a time to transition to all the tests.

MR. CARNEVALE: Okay.

MS. ARMSTRONG: So, when we talk about compliance in that sentence, we are talking about all the basic models, everything bottom line --

MR. CARNEVALE: Okay.

MS. ARMSTRONG: -- is when that kicks in. So there's actually a couple new --

MR. CARNEVALE: So it's existing versus new.

MS. ARMSTRONG: So there is a distinction in the way that the statutory provisions were written with regards to new basic models and then existing basic models.

MR. CARNEVALE: Okay.

MS. ARMSTRONG: And so that's why we kind of leave this table out. This is a copy/paste from the actual document you're reading from, but we leave this table up because in my mind this helps make clear there are different buckets that you may fall into depending on your requirements. Okay?

MR. CARNEVALE: Thank you.

MS. ARMSTRONG: Sure.

MR. BROOKMAN: Frank Stanonik.

MR. STANONIK: Frank Stanonik with AHRI. So just one other point, and I guess I'll state it trusting we'll cover it later. All right. So, in the case of this new model where I'm supposed to make my representations of efficiency using the UEF metric, so I'm producing those models. They're rolling out my door. I still have to put a Federal Trade Commission energy guide label on there. As we mentioned, at the moment there's no changes in the regulations for the energy guide label, so if I don't have a conversion factor, I can't convert back to put information as required by the FTC labeling regulations.

MS. ARMSTRONG: Right.

MR. STANONIK: Okay.

MS. ARMSTRONG: DOE is working closely with the Federal Trade Commission on these issues. I guess I do have one just question for you though. One of the things that we have I guess discussed here, and perhaps I'm going to get some looks, but do you think the conversion goes both ways? So can you back convert if you have UEF test data to EF? Does it actually go both ways? And the Department hasn't put out an opinion on that for a variety of reasons, but I guess a question for you guys. Do you feel like that

would be an interim solution for the labeling issue, yet still comply with the statutory requirements of testing for UEF until there's time for which the label transition can occur?

And perhaps you can think about it. I mean, today is not going to be the day the Department is going to be able to answer all your questions. We will certainly answer those for which we can, and I don't think today is the day that you're going to be able to answer all of ours either, but we welcome that ongoing discussion.

MR. STANONIK: Frank Stanonik of AHRI. Certainly other members can chime in here, but I think let's say in the current situation, and again, you know, trying to minimize confusion I think, yes, you're going to need to be able to back convert.

We're also on record that our preference would be that in fact dates slide so that the implementation of a new label could be concurrent with the implementation of the new test procedure. We'll get into that later too, but I think in terms of where we are today and what we're dealing -- you know, what you discussed, I think you have to have a back conversion.

MR. BROOKMAN: Hampton, you're next. Why

don't you get up here close to the table? Step forward so others can hear what you're saying.

MS. MEYERS: Just come take a seat at the table. I think we're going to be asking a lot of questions.

(Laughter.)

MS. MEYERS: I want you right over here next to me.

MALE VOICE: It sounded a little bit like coming into the party here.

MR. BROOKMAN: So for those of you that missed it, there's been a request that Hampton be seated at the table.

MS. ARMSTRONG: Aren't you glad I told you to show up in the morning when you asked yesterday?

MR. NEWSOME: And I won't be here this afternoon, so that's why I raised my hand just so we can talk about these. I guess if we could just dive into the label a little bit, you know, and I have some questions since I'm here and we're all here.

The issue with the DOE test procedure is something that, you know, DOE will be working on. As most of you know, the FTC rule basically says that whatever goes on the label is taken from the DOE test procedure, so the FTC staff generally looks at DOE as

to what is the test procedure and how do you comply with it.

With all of these changes, though, kind of aside from these immediate issues there's longer term questions about well, should the label -- what kind of changes should we make to the label in light of the new test procedure and what's going on here and issues like whether there should be any additional information on the label and whether the way that the first-hour rating, there are different bins for it, whether that should be reflected on the label.

And so what I'm wondering is in addition to those issues is there anything else that people are expecting or would like to see on the label that FTC should consider given that, you know, we have this window, this opportunity to change the water heater label?

MR. BROOKMAN: Karen? Please.

MS. MEYERS: Well, this is Karen with Rheem, and I think some further clarification I need not necessarily addressed to the label, but, you know, what do we do also about all the marking and consumer requirements on our websites and on our sales materials, how we represent the efficiency of the water heater. So those are all very key questions

that we have because for the model that I have going down the production line on July 13, when it gets to the end of the line and I ship it out to sit on a retail shelf, how do I label it and market it?

MR. NEWSOME: And when you say label, how are you marketing it aside from the FTC label?

MS. MEYERS: Aside from, you know, what's the yellow sticker I put on the line --

MR. NEWSOME: Right.

MS. MEYERS: -- and then that unit that has a production date of July 13 is sitting on a retail shelf and I'm advertising it. How do I do that?

MR. NEWSOME: Right. And so --

MS. ARMSTRONG: And by production date, you mean first production date of July 13 and after, not an existing model that just happens to be coming down the line? There is a difference.

MS. MEYERS: Well, there's kind of a difference in the conversion factor. I'm still not sure I understand the difference in the marketing and marking of that product. So I understand there's a difference in that, but the new efficiency descriptor of a water heater on July 13 changes, so it's now a UEF whether it was introduced and tested under the EF test procedure or under the UEF test procedure. So my

question is and what I don't know is, how do I market that? How do I label it? You know, what do I display on the point of sale material? What do I put on the sales brochures? What do I put on my websites? What do I do?

MR. NEWSOME: Well, there are no specific requirements from FTC outside the energy guide label for what you say. I mean, the law says that any energy representation you make needs to fairly reflect the results of the DOE test procedure. Now that's what the law says and that is a broad principle that when we dive down into the details here is probably not particularly, you know, helpful.

And, you know, without having concrete examples like I want to say this and this is what I get from the DOE test procedure and this is what I have been saying, you know, without those details, you know, it's not something that, you know, I can address. It's something we'd have to work with DOE on, you know, in terms of presenting concrete problems to them as part of your comments as something that, you know, we can work on and try to give guidance on.

As most of you know, the FTC label doesn't have an efficiency rating on it, so it just has the dollar figure and so that, as I understand it, that

process isn't changing. That gives FTC an opportunity to change the label all at once so we can update the ranges if they need to be updated, provide additional information on the label if that needs to be done, and that can all be done at once.

As to your advertising representations, from the FTC perspective, generally, you know, we look, outside of the label, we look to see whether the claims are deceptive or not, and that gets into, you know, what FTC generally does is just dealing with deceptive advertising and that's always a very fact-specific thing.

So, in terms of the kinds of things that you want to say in your advertising, in your website, in stores, I think that that's something that you'll have to just look at from a case-by-case basis and raise it with DOE and FTC.

MR. BROOKMAN: This seems to be -- Karen, are you finished with this? Other people want to chime in. I want to give you this chance.

MS. MEYERS: Sure. Come on. I'm sure I'll chime back in.

MR. BROOKMAN: Okay. Charlie first and then to Steve.

MR. STEPHENS: Yeah. Charlie Stephens.

Just to help Karen's inquiry here, the label right now based on our data from where I live grossly overestimates energy use annually because it's based on the old test procedure draws of 62 point whatever gallons per day. The new test procedure doesn't use that same number, so for a medium-sized tank it's like 55 gallons. It's a smaller amount of hot water.

And so, if you actually start labeling this thing in any way with a UEF, that test implies a whole different level of annual water use and therefore annual dollars and annual kilowatt hours than what's on the label today and it's more realistic based on our data. It's still a little high for us, but it's still much more realistic than the old numbers.

But what do you do on July 13 about the dollars and the consumption when the conversion that's being certified is based on a different amount of annual hot water use?

MR. NEWSOME: Well, that for now, it's my understanding, is not changing. I'll defer to DOE in terms of the transition to the test procedure and what's being required on the label, but there will be a transition eventually and it'll be what we're trying to do I think is to coordinate that so that we have a single time when the label changes over to reflect the

new test procedure.

MR. STEPHENS: So the same label would continue?

MS. MEYERS: So I can continue to advertise units with an EF. I know the EF number doesn't go on the energy guide label, but it is used to describe the efficiency of the water heater in your sales and marketing materials. So I don't know what to do with models that I produce after that. How do I describe them? What do I put in catalogs? What does Home Depot say on their shelves is the efficiency of that water heater?

MS. ARMSTRONG: So I'm going to transition the representations discussion into what we propose that you certify to the Department, and so I think that helps at least answer parts of it from our perspective, but obviously from Hampton's perspective we will need to have some discussions about the label.

I mean, the label -- I think that's why he's trying to tee up the questions today of well, if I'm coming out with a new label to accompany the UEF descriptor, is there anything else you guys want to see on it? The sky is the limit. Here's your ask. So he's asking you for input today. With that being said, to go back to the cert provisions, but --

MALE VOICE: Thank you.

MS. ARMSTRONG: It's okay. I'm going to do this somewhat by memory. So, Karen, my question to you was if that unit coming off of your production line on July 13 or July 14 or whatever date it was is new or not. Is it first production or is it a previously manufactured model that had been certified using EF or standby or whatever? It matters.

MS. MEYERS: Okay.

MS. ARMSTRONG: There's a clear distinction there.

MS. MEYERS: Okay. So I guess the question to both of them then, so let's say it's not a new production. It's a model that was certified under EF.

MS. ARMSTRONG: So right now you have EF test data. You have the test data underlying your certification and your ratings. You've come up with your rating for EF in accordance with the EF test procedure and sampling plan. You've already certified that EF value, that it's compliant with standards, the new April standards with the Department, right? You have that set of information.

MS. MEYERS: Okay.

MS. ARMSTRONG: On July 13, the UEF test procedure goes in for new models. Until we finish the

conversion factor you won't be able to convert that rating, so you will continue using EF until we finalize the conversion factor rulemaking and give you conversion factors, in which case you need to start using UEF. It's what that second bullet says, right? For basic models previously certified prior to July 13 it's the date of publication of the conversion factor rule that you transition your representations. You have to --

MS. MEYERS: Okay. So help me through that one more time. So I have an EF --

MS. ARMSTRONG: From EF to UEF.

MR. STEPHENS: To whom?

MS. ARMSTRONG: UEF.

MR. STEPHENS: No. To whom?

MS. ARMSTRONG: To us.

MR. STEPHENS: To you.

MS. ARMSTRONG: Now our proposal was to allow certifications that have EF information as well as the newly converted or tested UEF information, and both of that set of information for previously certified models was to come to the Department.

Now Karen is asking a step further. Well, what about representations to the consumer, which is where you're going with your question, and we stopped.

We haven't answered that whole question in its entirety, but I think what we're telling you is you have this EF test data.

MS. MEYERS: Right.

MS. ARMSTRONG: You have that information. We have asked for you to submit both to the Department with the intention that both would be going on our website. So for a given model you would have EF, you would have UEF, for models already distributed in commerce.

MR. STEPHENS: Okay.

MS. ARMSTRONG: Can I get to the new model first before we go with questions?

MR. BROOKMAN: Yeah. Okay. Keep going, Ashley. Yeah.

MS. ARMSTRONG: Then, Karen, for your second question, which is a little, it gets to the practical considerations that you guys raised earlier, and it's UEF, right? So for new basic models introduced into commerce, the test procedure hex. There is no conversion applicable to them.

MS. MEYERS: Right.

MS. ARMSTRONG: You don't have EF, you don't necessarily have EF test data. You could elect to have it. But you're required to use that new test

procedure.

MS. MEYERS: Right.

MS. ARMSTRONG: You have to have UEF test data for new models beginning July, first date of production, July 3 on.

MS. MEYERS: Right.

MS. ARMSTRONG: So that's where my question comes in earlier about back calculating EF and is that something you guys feel is reasonable to do. Does the conversion go both ways? Because that would allow you -- you won't have EF test data unless we say you have to test to both. And right now the conversion factor doesn't do that.

What it does is the effective date of the new test procedure is EF. Actually, it says you must use the new one for new basic models. It doesn't allow you to use the old one. So you won't have EF numbers necessarily to make representations of, unless we do some type of other type of conversion the other way for this one-year period where, if we feel both are needed, which we didn't go there. That's not what the statute requires.

So that's where the questions. There will be a one-year transition period when you will have two metrics based on two test procedures. Some will be

converted, some will be tested, and that's why it's one year. It all goes away in one year.

MR. BROOKMAN: Charlie?

MALE VOICE: I'll wait for this back and forth because I was going to go to a different area.

MR. BROOKMAN: No. That's my --

MALE VOICE: Yeah. I'll go to a different area.

MR. BROOKMAN: That's why I was -- that's the stream that I was following.

Charlie?

MR. ADAMS: Okay. Thank you. Charlie Adams, A.O. Smith. So for, make sure I understood what I think I just heard --

MS. ARMSTRONG: I'm not sure what I just said, so --

MR. ADAMS: Good. I don't feel so bad then. So from a number or a metric certified to DOE. Forget about who we, whether we label it or advertise it or we talk about it, the number that we report to you, there's a period of time, I think I just heard, that we can report an EF on applicable units, we can report a UEF by test on applicable units, and we can report a thermal efficiency and standby loss on applicable units.

MS. ARMSTRONG: A UEF by --

MS. MEYERS: Conversion.

MS. ARMSTRONG: -- conversion.

MR. ADAMS: And we can get all of those to a UEF by conversion.

MS. ARMSTRONG: For previously certified models --

MR. ADAMS: For two of the three, the previous two, the thermal efficiency standby loss and the EF by test, we can convert those to UEF with the conversion factor.

MS. ARMSTRONG: Correct. And you can give us all four metrics. Not only can you, but the proposal is you must.

MR. ADAMS: Right. And I'm okay with that, and by the way, I'm okay with converting both ways. If we have a mathematically sound conversion factor, there's something I learned in the third grade that says we can work it both ways, so I'm okay with that. So I guess the question still boils down to all the --

MS. ARMSTRONG: Correct.

MR. ADAMS: The real issue of the July 14 unit, have I complied with the minimum efficiency standard --

MS. ARMSTRONG: Correct.

MR. ADAMS: -- and also all the collateral information, what do I -- do I confuse the consumer even more for a year by talking in terms of three different metrics? That's a problem. That's one of the problems that this whole thing was supposed to fix in the first place.

MS. ARMSTRONG: So I agree, but you guys also can't make your transitions overnight. So while eliminating confuser -- confuser -- consumer confusion is really important, I think it's equally as important not to say you have to flip on a dime, you know, in a 24-hour period.

MR. ADAMS: Yes.

MS. ARMSTRONG: So that's what that one year was supposed to do. You know, as an industry, if you guys want to talk to both Hampton and DOE about how you message to consumers, I mean, really that's more -- we can explain what our test procedures allow, but generally speaking, what you just explained is consistent with our proposal. That was what we said in our proposal.

MR. BROOKMAN: Back to Charlie.

MR. STEPHENS: Charlie Stephens. I think this might help clarify because right now I'm a little confused. I want to read from something in your

proposal here. It says, manufacturers would not be required to submit revised certification reports for previously certified basic models until the next annual certification date, May 1.

MS. ARMSTRONG: Correct. Yeah.

MR. STEPHENS: What does that have to do with one year? And what this tells me, I mean, and tell me if I'm wrong here, is that if you have an existing model, you don't have to certify to DOE anything on that thing --

MS. ARMSTRONG: Correct. We were trying to give them time.

MR. STEPHENS: -- until next May --

FEMALE VOICE: Yeah.

MR. STEPHENS: -- and you don't -- and I guess that means you wouldn't have to change the energy guide label either.

MS. ARMSTRONG: Not --

MR. STEPHENS: This is the problem. I think the crux of the conversion, of the back conversion here, is that unless Hampton changes his rules to be consistent with that, then they're still stuck with the idea that they have to put the FTC's correct information on the energy guide label as with current rules. But to me that means EF data, which is what

they can leave on certification with DOE until May 1 of next year, right?

MS. ARMSTRONG: For previously certified models.

MR. STEPHENS: For previously certified models. So it seems to me that the only thing we're talking about here really is new models. And Charlie's correct, there's some serious issues --

MS. ARMSTRONG: Right.

MR. STEPHENS: -- with new models about knowing what standard you're meeting and whether the conversion factor is correct and whether the, you know, all that. Then they have a problem with Mr. Newsome's rules on labeling as well. So it seems to me new models are only the real problem until next May 1. Am I wrong about that?

MS. ARMSTRONG: Well, May 1, that's your annual cert date, so we didn't make you recertify in the interim. We actually just said you've got a pass until May 1 of the next year even though you can already translate your existing data.

MR. STEPHENS: That's what I read here.

FEMALE VOICE: Yeah.

MR. BROOKMAN: Yeah. We're working our way towards --

MS. ARMSTRONG: It was done on purpose to make it easier.

MR. BROOKMAN: -- clarity I think. I want to stay -- are you in this same stream of content, Harvey?

MR. SACHS: Yes. Yes. I'll -- go ahead.

MR. BOROS: No, no, no.

MR. BROOKMAN: To Joe then. Joe, please.

MR. BOROS: Because I want to roll the tape back while -- I just need to talk while Hampton's still here.

MR. BROOKMAN: Yeah. We won't let him leave.

(Laughter.)

MR. BROOKMAN: Joe, go ahead.

MS. ARMSTRONG: I didn't know I was having your public meeting, but I could have stayed home this morning.

MR. BOROS: I'm still trying to understand what happens with the existing models. So effective July we'll be converting from EF to UEF and making representations -- so that's clear -- on existing models.

MALE VOICE: No. No.

MS. ARMSTRONG: You can.

MALE VOICE: You can.

MALE VOICE: You can.

MR. BOROS: That's what the conversion factors --

MALE VOICE: They're saying you don't have to.

MR. BOROS: You don't have to --

MS. ARMSTRONG: We're saying you'll have to recertify under the program until May 1.

MR. BOROS: I understand.

MS. ARMSTRONG: So if you want to wait until May 1 to --

MR. BOROS: I understand. However, the energy guide label will utilize, will continue to utilize, if I heard correctly, 64.3 gallons per day as the basis for establishing annual operating estimates, annual operating cost estimates.

MR. NEWSOME: Well, just to back up, the FTC rules, all they say is whatever you put on the label has to be generated by whatever DOE tells you to do under the test procedures. So there's nothing specific in the FTC rule about you've got to do it this way or this, that way. It just says basically go to DOE and put on the label what DOE tells you to put on. And what DOE has been saying here is that

they're, you know, going to use, for the label, they're going to use the old method until we can convert it all at once.

MR. BOROS: Right. So those models that we convert will be in different bins, different draw bins.

MS. ARMSTRONG: So can I ask you a different question before you go? Are you going to elect to make the conversion on July 1 just because you can, or are you going to wait to do it until when you have to, which is May 1 of the following year?

MR. BOROS: That's a good question. I'm not sure yet.

MS. ARMSTRONG: Because I think that --

MALE VOICE: I thought you said there that we must transition.

MS. ARMSTRONG: Well, so there's nuances, right? That's why your cert date was bumped to May 1. We got a little creative to help you, or we tried to.

MS. MEYERS: Well, you got creative to confuse me.

(Laughter.)

MS. MEYERS: I hope you're helping me, but I'm not there yet, so keep talking.

MALE VOICE: I might like it if I understand

it.

MR. BROOKMAN: Charlie, can you, do you want to restate what you -- say again how you thought you were going to provide them some help. Ashley. I'm sorry.

MS. ARMSTRONG: So while the statutory requirements require you to transition beginning May 1 --

MS. BARHYDT: Transition is a key word there.

MS. ARMSTRONG: Transition. The statutory requirements say the UEF, the conversion factor, once it's out, it starts this one-year transition period, and you must transition on that one year, whenever the final rule comes out of this rule, right?

What we did was say, well, to DOE, your certification is what you need to tell us what your ratings are. You need to sign that statement, et cetera, et cetera. All that's associated with certification.

Instead of saying you all have to certify again on July 13, we said you don't need to do it until your next annual cert date, which is May 1, 2016. Technically, you do not have to certify your converted or your tested UEF values for previously

certified basic models that have valid EF or thermal efficiency/standby loss ratings until May 1, 2016.

MR. BROOKMAN: Charlie?

MS. ARMSTRONG: There was --

MR. STEPHENS: Yeah. Ashley, one further clarification to add on to that.

MS. ARMSTRONG: Everyone's staring at me.

MR. STEPHENS: Then that means that for those models you wouldn't have to do any kind of conversion factor work until the period between May 1 and when the conversion factor expires.

MS. ARMSTRONG: So, on May 1, they need to send in their paperwork of the converted values.

MR. STEPHENS: Right. And you could do converted --

MS. ARMSTRONG: But in varying that date --

MR. STEPHENS: -- values until --

MS. ARMSTRONG: -- excel exercise.

MR. STEPHENS: Right. And then it expires and then you have to test.

MS. ARMSTRONG: The testing has to be done by the one-year mark.

MR. STEPHENS: By the one-year mark.

MS. ARMSTRONG: Right.

MR. STEPHENS: Right.

MS. ARMSTRONG: They built in some flexibilities there, so if you decide to start making -- so one -- a question for -- if they decide to start making representations prior to the May 1 date, do they need to recertify?

MR. BROOKMAN: And what about brand new models?

MS. MEYERS: Let's not go there yet.

MR. BROOKMAN: We're not going there yet. Okay.

MS. ARMSTRONG: We're just going to table those.

MR. BROOKMAN: Okay.

MS. MEYERS: Let's get on the existing models. So we all just came out with new models --

MS. ARMSTRONG: Right.

MS. MEYERS: -- April 16.

MS. ARMSTRONG: Which is why this kind of somewhat works.

MS. MEYERS: Right. So on all these models that we've all done all the testing on and certified under the EF, we can -- and I don't know if I'm stating this right, so -- we can continue to use that EF metric until we have to recertify on May 1.

I don't know what Hampton's going to let us

do on the labeling part, which is really, really key, but we can continue to use that EF until May 1, and then from May 1 'til one year after the final rule -- and you're shaking your head. I already got it wrong. See. Okay.

MS. ARMSTRONG: You're going -- well --

MALE VOICE: No. No. You got it. Yeah. Finish what you're going to say. Finish what you're going to say.

MS. MEYERS: So on May 1 you're going to have to turn in a cert report and that cert report is going to have to have the EF and the converted UEF --

MS. ARMSTRONG: Or tested.

MS. MEYERS: -- or tested if you've already completed that testing. And then one year after the final rule you're going to have to have tested UEFs for everything.

MS. ARMSTRONG: So it's not one year after May. It's one year after the final rule of the conversion factor. So it's more likely a couple months after May.

MR. STEPHENS: So for some models you might have to test -- if you don't test them before May and you use the conversion factor, you will have to test and then recertify them.

MS. ARMSTRONG: Correct. Yeah. Yeah.

MR. STEPHENS: Okay.

MS. ARMSTRONG: Yeah. Yeah. So, if Hampton says that your label needs to be based on the DOE test procedure, you have ratings that are based on the DOE test procedure for a while.

MR. BOROS: Which would be 64.3 gallons per day, right?

MALE VOICE: Right. Yeah.

MR. BOROS: But at the same time we'll have new models on the marketplace --

MS. ARMSTRONG: So the issue -- we get the new model --

MR. BOROS: Well, let me get, let me get --

MS. ARMSTRONG: -- we get the new model -- actually, we're talking about existing models because we just decided that you guys have introduced all your new models before April 15.

MR. BOROS: Right. The point that I was trying to make is that we will have new models on the marketplace and there will be representations made with UEF that will have been tested at different daily hot water use. So --

MR. SACHS: There will be a bias.

MR. BOROS: Yes. So the consumers will be

confused whether this EF or UEF is based on 64.3 gallons or 55 or 84. So, in my opinion, that creates a real problem in terms of what we present to the consumers.

MALE VOICE: Yeah. And I think that's a --

MR. BROOKMAN: So thank you, Joe. Now Hampton. If we could please start saying our names. Hampton?

MR. NEWSOME: Hampton Newsome. And I should -- I -- as always, I'm speaking as a member of the FTC staff and not for the Commission, so, you know, I always try to say that. So the, you know, the question about -- so the question here is about representations. And from FTC's perspective, basically, you know, we talked about earlier that there's this very general statement in the law that you have to -- your representations have to reflect the results of the DOE test procedure. Well, here DOE test procedure has all these different metrics.

When the FTC staff has addressed these types of questions in other contexts, you know, there's a recognition that sometimes the advertising will involve information that is maybe not the specific metric on the FTC label or the specific metric that's certified to DOE to meet the standards. Sometimes

there may be information that, you know, is unrelated to the test procedure but is still vaguely related to energy.

And so the bottom line for the FTC staff is to look and see whether the -- and there's no -- once you're outside of -- once you meet the requirement of representing the results of the DOE test, you know, whatever that basic metric is, and you've got other metrics or you're concerned that that metric may be confusing because you've been using another metric, what we're looking at is whether the representation is deceptive to consumers.

And so, if you have a situation like this, what you want to be considering is whether there, on your website or wherever you're doing this advertising, whether you need to provide disclosures, additional information, to make it clear to people that, you know, this number, you know, means X and, you know, if you provide another number, this number means Y, and do it in a way so that people aren't confused.

Now, you know, I'm just an attorney and so all of this stuff is fairly technical and so I'm not saying it will be easy to do, but that is the basic way that we would approach these types of issues.

MR. BROOKMAN: Russell?

MS. ARMSTRONG: I mean --

MR. BROOKMAN: Go ahead, Ashley.

MS. ARMSTRONG: Can I just say one thing real quick?

MR. BROOKMAN: Go ahead.

MS. ARMSTRONG: You're going to have this transition situation anyway, right? You're going to have a period of time, whether it's that full year or whether you do it from the May to the, you know, one-year expiration date, which is going to be a couple months, you're going to have a period of time for which UEF and EF exist in the market.

We've gone through this a number of times with a number of products now that we're starting to overhaul test procedures and metrics. There has been some desire to have some time for manufacturers to transition their ratings, their test data, their literature, their marketing, albeit maybe a limited amount of time to not cause too much consumer confusion. But I will say, you know, that has happened. We have successfully kind of gone through it before, you know.

We will also put an explanation on our website, on our database, in terms of what these

different metrics mean, how they're not comparable, blah, blah, blah, and that kind of stuff as well.

MR. NEWSOME: Yeah. And it's not a unusual problem.

MS. ARMSTRONG: Right.

MR. NEWSOME: It comes up in a lot of --

MS. ARMSTRONG: Exactly.

MR. NEWSOME: -- product categories. There are conversions all the time. These guys are changing test procedures or standards on a, you know, kind of schedule and so we have these transitions not only with the label but with representations. And as Ashley's saying, you know, what you try to do is kind of minimize this transition.

And the manufacturers, if they're concerned that, well, this representation I'm making is deceptive, then you want to consider providing disclosures to help that, and you can certainly reach out to me and to DOE and we can talk about, you know, the specific problems that you're having.

MR. BROOKMAN: I want to make sure we get as much clarity and closeout on this stream of content as possible. Are you --

MR. PATE: I'm speaking to this stream, yes.

MR. BROOKMAN: Go ahead, Russell.

MR. PATE: Yeah. Well, adding to your point, say FTC looks for things to not be deceptive: the literature, the marketing, the labeling. I believe there's an argument to be made after July 13 that the energy guide label in place at that time can potentially be deceptive, because if you're trying to back convert existing models now to an EF to calculate annual costs, they were tested to a different procedure, drawing higher amounts of water potentially for a similar sized water heater that's a new model after July 13, tested to the new procedure, so your annual energy consumption costs potentially will be lower for a similar model with a similar EF.

And so you're telling the consumer this costs a less amount of money to operate, but it's really an apples and oranges comparison at that point in time.

MS. ARMSTRONG: So you'd never back convert existing models, though. You'd already have that EF data.

MR. BROOKMAN: Frank, go ahead.

MS. ARMSTRONG: The issue would be with --

MR. PATE: Right, but it's tested under a different procedure, with different draw patterns.

MALE VOICE: Different daily hot water use.

MS. ARMSTRONG: So I guess I'm not, you know, I guess I'm not following because, in my opinion, EF readings as they are generated and even converted EF readings should be represented above the EF test procedure, which has the same amount of -- you know, if the back conversion is valid, that's what that means. It's representative of that test procedure. There's no confusion there. EF ratings mean one thing and that's what -- you know, the test procedure specifies that gallons per day, et cetera, et cetera.

Now that being said, UEF ratings means something different, and whether they're tested or converted, they all mean the same thing, at least generally representative of that test procedure. By statute, that's what's required.

FEMALE VOICE: So, Ashley --

MR. BOROS: Well, let me --

FEMALE VOICE: Go ahead.

MR. BOROS: Can I just jump in?

MR. BROOKMAN: Joe.

MR. BOROS: I think the point there is that you could have two water heaters on the market at the same time, both -- let's just use two 50-gallon electric water heaters. One has an EF base value, the

other one has a UEF base value. One's tested with let's say 55 gallons per day, the other one's tested with 64 gallons per day. And let's assume they have similar, you know, EF outcomes. They're going to have different estimated annual operating costs. They'll be on the market, on the shelf beside each other that will have different operating costs. How is the consumer supposed to make a selection between those two?

MS. ARMSTRONG: So your point -- I think the point you're trying to make is if -- I think what you're trying to ask Hampton, and I'm going to translate this and see if I got it right, is, Hampton, for models that DOE says have to be tested pursuant to the UEF test procedure, can they apply the EF label if DOE provides a way to convert the UEF test data to the EF values such that you get annual energy costs that are representative of the EF methodology? I think that's what they're asking.

MS. MEYERS: Well, this is Karen with Rheem and I have another question. So --

MR. BROOKMAN: Well, maybe Charlie could --

MS. ARMSTRONG: I don't think you want to answer that.

MR. NEWSOME: Well, I mean, the basic

question is whether the DOE test procedure is representative and what they're trying to do during this transition, which is incredibly complicated, whether that's adequate or not. And so it's really a question about whether the DOE test is representative, and so I think Ashley --

MR. BROOKMAN: I want to make sure we try to respond to Ashley's restatement. Maybe either Charlie or Frank or this Charlie could -- you want to start, Charlie?

MS. ARMSTRONG: So, Joe, to say it another way, if I were to provide you a back calculation of EF from UEF test data, back calculated EF, which in theory should take care of the differences between the two test procedure, and then I said your label has to be based on the annual costs that you would derive from that EF value, do you have an issue?

MR. BOROS: Well, yeah, I guess we have a couple of issues, but the first issue -- and I think Frank Stanonik already presented our lack of confidence with how, you know, the --

MS. ARMSTRONG: So that's a different issue, right?

MR. BOROS: Right. So --

MS. ARMSTRONG: That's a technical issue.

But fundamentally, as a process issue, your answer should be no. I mean, to the extent you believe in the conversion -- and at the end of the day we all believe in the technical aspects of the conversion -- your answer has to be no. That's what the conversion is supposed to be.

MR. BROOKMAN: Karen?

MR. BOROS: Understood.

MS. ARMSTRONG: So do you agree with me?

MS. MEYERS: To convert a model and label it correctly you could only convert it to a high bin model, right? Because the label would be based upon 64 gallons.

MS. ARMSTRONG: Not necessarily.

MR. BROOKMAN: Charlie?

MALE VOICE: Charlie Adams has been waiting for a while, so --

MR. BROOKMAN: Harvey, thanks for being patient.

Charlie?

MR. ADAMS: Thank you. Charlie Adams, A.O. Smith. Let me restate what I think I hear Joe's problem to be. If I have a model that I have in -- that I've -- that I've put in production and put in the marketplace July 1, so I'm ahead of the 13th

cutoff --

MS. ARMSTRONG: Yep.

MR. ADAMS: -- it has an EF test method that has a dollar amount, dollar operation developed in terms of the 64-gallon EF test method --

MR. BOROS: On the label.

MR. ADAMS: -- on the label, I have -- I didn't do it on July 1, I did it on August 1, exact same hardware, okay, I have to use the UEF test method and it falls under the 55-gallon bin, it uses less energy and therefore costs less money to heat 64 gallons a day than it does 55 gallons a day.

MS. ARMSTRONG: Yes.

MR. ADAMS: So the model that I had on the market July 1 has a dollar amount of operation calculated by the appropriate methods here on the label. Its exact twin, it's a month younger, that was tested by the UEF test method at 55 gallons, converted backwards to get the EF so I can do the calculation, has a lesser dollar amount. One of those is deceptive to the consumer I think is what Joe said.

MR. BOROS: Yes. That was my point.

MS. ARMSTRONG: But I think what I'm trying to say is that if DOE provides you -- and we haven't got there yet. We haven't had those discussions. But

what I think I'm hearing you ask for is, you know, what goes on the label, the dollar calculation, is part of the DOE regs, it's not part of Hampton's regs, so what you're really asking for is -- and that's why I asked at the outset about my back conversion question, because if we provide you a method of back conversion your ask would be also to provide you a method of dollar amount that would be comparable to an EF rating. So, in other words, you wouldn't be using the 55 gallons.

If you're going to -- if we're going to allow the back conversion, we would make everything comparable. That multiplier would have to be consistent with the EF test procedure. You wouldn't just pull the new multiplier from the UEF procedure. Everything would have to line up. But, in theory, it all hinges upon being able to convert properly.

MR. BROOKMAN: Frank?

MR. STANONIK: Frank Stanonik with AHRI. Two things. First of all, I mean, we've been discussing how you calculate your cost of operation on the label, okay? And Hampton pointed out the regulations simply say you use the DOE test procedure, but the FTC regulations do specifically identify the ranges of comparability you use, and those are based

on the first-hour rating of the --

MS. ARMSTRONG: The current.

MR. STANONIK: -- current test procedure, okay? The UED test procedure absolutely blows up the ranges of comparability because we now have products and we tested the different water draws depending on what bin they fall in, and so that becomes a critical change. And so the idea that you could simply use the existing label and just manipulate your cost of operation is a half a step that doesn't solve the issue.

So, to Ashley's point, it is absolutely critical if the -- the labels at the moment are not going to change. The rules haven't changed yet. So it's absolutely critical there would be a back conversion.

And the thing to keep in mind is, okay, all the conversion factors are taking water heaters that have been tested to 64.3 gallons a day and converting it to whatever bin it fits in. And it's absolutely critical. We all want the correct conversion factor.

MS. ARMSTRONG: Right.

MR. STANONIK: But if you have the correct conversion factor, the back calculation should work to take a product that maybe was tested in the medium bin

and calculate, estimate its cost of operation as if it was still doing 64.3 gallons.

MS. ARMSTRONG: Exactly.

MR. STANONIK: It should all work.

MALE VOICE: It should.

MR. STANONIK: One other point to remember that, again, it's just another factor. We keep talking about less gallons. It's less gallons of cooler water. The new test is 125 degree water, the old test is 135 degree. Nominal tank temperature 135. So not only is it less water, it's water with less energy it. So there's no question, again, once we get the thing running, that certainly products in the low and medium usage bin are going to have lower costs of operation even though it looks exactly like that water heater that just rolled out your door today.

MR. BROOKMAN: So we're not worried about deceiving the consumer here.

MR. SACHS: I'd like to build on the last couple remarks with an outrageous suggestion, which is uncommon for me. The first thing that occurs to me is that we really do have a qualitative change, that the absolute essential for Hampton's new label, the 2016 label let's call it, is that it clearly identify for the customer that this rating is based on the usage

class: very small, small, large, medium and large.

It's a very different label then. And I wonder if the way to resolve some of this, and it would probably have to be combined with some slippage in the effective dates, is to simply continue to use the old label for EFs with one note added which says this label goes away, if a new labeled product is available, it will give you a better estimate of your operating cost, and the new labels then are UEF-based.

Now I haven't completely thought out of this, this out, but I think it is a transition here, and accepting that and accepting that there's a lesser label and a better label would wind up lining incentives so manufacturers want to transition more quickly rather than less quickly even though they probably would want to delay a couple of product introductions from July 12 to July 15.

MR. BROOKMAN: Frank?

MR. STANONIK: This is Frank Stanonik, AHRI. I just want to mention, following up on what Harvey just said, we in fact have went ahead and drafted what we think would be a recommendation for an improved label and a critical -- Hampton asked this question what do we think needs to be added.

The two things we think would be necessary

on this new label is, first of all, you would only compare models in the same bin, and there would be information on the label that clearly tells the consumer essentially that fact, that, you know, there are -- A) that you only should look at models in this bin, and there are other bins, but you need to look at the one.

So, I mean, it's at this point a recommendation, and hopefully, as things go on here and the label does get changed, most of it will be implemented.

MR. SACHS: This is Harvey. Following up, I'm certainly not a human behaviors expert, human factors expert by any means, but it seems to me that somewhere on that label we have to have a little bit of guidance that says medium is designed for consumers who have X number of people in the household or something like that. There has to be a short phrase either on that specific bin or on all of them as sort of a graph. But end of the comment.

MR. NEWSOME: Well, yeah. And I guess that -- and so I appreciate those comments because they're very helpful because one of -- I mean, aside from all these transition, very difficult transition issues, you know, one thing that this possibly does is

give an opportunity to improve the label.

For decades the main -- for storage water heaters, the main disclosure has been first-hour rating, and to my knowledge, that term has never been comp tested. We don't really know how consumers interpret that. It's presented in gallons. Most of these products are marketed in terms of gallons in terms of their storage capacity.

So by having these bins with these kind of qualitative names, does this provide an opportunity to make the label clearer and better for consumers, and what's the best way to organize this.

MR. BROOKMAN: Charlie Stephens?

MR. STEPHENS: Yeah, I can speak a little bit to that because we dabble in this area. The first-hour rating was always, up until now, based on the EF test with a average tank temperature of 135 degrees, which isn't actually how water heaters are delivered to the store. They're delivered with the set point at 120 typically, and typical delivered water temperature is about 125.

So the first-hour rating that's on the label based on 135 degree average tank temperature actually isn't the first-hour rating of the product that's on the shelf as it's delivered with its set point.

That's the way it is today.

However, our codes, our plumbing codes actually rely on those first-hour ratings. That's how you size a water heater for a house with so many bedrooms. You know, if you have a house with five bedrooms, you can't put a water heater in there with a 60-gallon first-hour rating. The plumbing code actually uses those numbers.

So it's actually more important than most people realize that those numbers be reasonably accurate because we're sizing water heaters for houses by law in many states using them. So we really should try to be better at that, and I think the new test procedure does actually get at that better.

MR. BROOKMAN: Charlie, follow on?

In a little bit we're going to move on, folks, just so you know. Charlie?

MR. ADAMS: Follow on to Hampton's comment. Water heaters are sold on first hour because that's how we size them, that's how we know what to put in. We've got a 50-gallon water heater that fires at 100,000 BTUs, it provides beaucoup hot water. If you want one at 75,000 BTUs or at 50,000, 40,000 BTUs, you need a bigger size tank. So we do not sell on you need a 50-gallon water heater. It's I've got a 50-

gallon water heater that delivers the amount of water you need. So we sell on first hour.

MR. NEWSOME: Yeah, but isn't it true if you go online to a big box store or something and you look at water heaters one of the primary descriptors is the size of the water heater, right?

MR. ADAMS: It's a descriptor, but there's also sizing guides on how you put in --

MR. NEWSOME: Yeah. Yeah.

MR. ADAMS: -- how many people and how many bathrooms and it will tell you which one of those to go get.

MR. NEWSOME: My question is whether having those two metrics, which are both in gallons, whether that's confusing to people and whether there's a way to improve the label to communicate that.

MR. ADAMS: There's 40 ways to -- there's a lot of ways to improve the label, but don't lose first hour because that's the important number. The storage volume is not. Otherwise, tankless water heaters would make no sense.

MR. NEWSOME: So, and both of these comments and then, you know, we can stop talking about label. So what you're saying is even if we go with the DOE bins, the label somewhere should have the specific

number for first-hour rating because it's important to list.

MR. ADAMS: Yes.

MR. BROOKMAN: Okay. Hampton, noting that you're not going to be with us in the afternoon, is there anything else you wish to try and clarify now?

MR. NEWSOME: I feel like I've had a full plate this morning.

(Laughter.)

MR. BROOKMAN: I want to finish this out, Steve. I haven't heard from you yet. Go ahead.

MR. YORK: And I don't want to talk about the label, but I do want to talk about representation. James York from Rinnai.

You stated when we were talking about this conversion factor and representations, you said -- and the way that we interpret it or way I interpret it, when it says must transition, means that the date that it becomes effective we must transition all of our representations, and your comment back was if you choose to.

So is it the department's thought that each manufacturer can choose to transition somewhere between the effective date and the one-year twilight of it and we can all do it at different times and so

that I may have products immediately out there in UEF because maybe I think it's a great metric and Charlie comes in three months later and Karen comes in nine months later and Alex is always late, so he comes in at the one year point? Because now the market's confused. I mean, that's one of our big things. And so, I mean, that's our question about representation. I know you say you haven't addressed it, but you implied that it was a choice.

MS. ARMSTRONG: So this is Ashley from DOE. I'm going to choose my words carefully here. What we did propose was that you're not required to recertify until May 1. That gives you some flexibility I think. We were doing it because we thought we were helping you. I think that was our intent, you know, when we looked at the different options and what the statutory requirements are.

However, if you believe that it will cause more market confusion and more harm than good and you shouldn't be doing something differently than Charlie, and since Alex is going to be behind anyway according to you, you know, we don't have to worry about him, but if you believe everyone should be transitioning on a date all at the same time and that date should be July 1, that's what the proposal is for: comment.

You know, our perhaps misconception here was that by allowing you some leeway until the May 1 annual cert date, that that would help you.

MR. BROOKMAN: Charlie?

MR. STEPHENS: I'll just add one thing I was going to say earlier, and I think this always happens when you have this kind of a discontinuity in test procedures. The problem here is the length of time during which it can occur, and that grace period, if you will, or that flexibility period until May is one of the things that's causing that. But, you know, is that more important than the confusion in the marketplace?

One of the things that I think is, we'll get to this afternoon I hope, is that unless we can get the conversions right, which I have my doubts about unless we can straighten out a couple of things, then I would almost rather that we wait as long as possible for the conversion and then everybody convert at once with the right numbers, which in my mind would probably be tested numbers, or closer to a period when we all get tested numbers that get certified and get on the label and everything else.

I'd rather be using the old labels until we can actually get numbers that don't rely on a

conversion factor at this point, unless I get a lot more confidence in the conversion factor.

MR. BROOKMAN: Charlie, go ahead.

MR. ADAMS: One comment on the conversion factor and testing versus conversion. Let's not lose sight that if we delayed long enough that everybody had time to test everything, there's still a very significant conversion factor impact because the conversion factor is what translates the EF minimum standards into UEF minimum standards, so --

MR. STEPHENS: Yeah. I know.

MR. ADAMS: -- that never goes away.

MR. BROOKMAN: Going back to Frank's earlier comments, Steve Rosenstock, you've been so patient. I've never seen such patience from you.

MR. ROSENSTOCK: And you may not again.

(Laughter.)

MR. BROOKMAN: Thank you very much for that.

MR. ROSENSTOCK: Doug, thank you, I think. I'm looking -- I'm on a different stream here for products that are using uniform energy factors, thinking about the label in the future, new models using just the energy factors. From now on they're going to have four efficiency values based on the draw pattern. There's four uniform energy factors for

every storage water heater in the future. What?

MALE VOICE: Not here, no.

MR. ROSENSTOCK: According to this, yes. Hold on. Hold on. Therefore, if you're thinking about, you know, the label, it's both, you know, right now you're showing an operating cost range. I'm just thinking, well, you know, do you help the consumers with different draw patterns by showing four cost ranges, or do you just show the one cost range and then based on one draw pattern? I mean, I'm just thinking about this because if it says the FTC has to be based on the DOE test procedure and the DOE test procedure shows all these ranges, is FTC required to show all the values or just they can pick and choose. Again, I'm just thinking about this, you know, in the future for possible consumers looking at those future water heaters with the UEF label. Again, I'm just --

MR. BROOKMAN: Yeah. Frank?

MR. STANONIK: Frank Stanonik, AHRI. But, Steve, depending what bin the model falls in, only one standard applies.

MALE VOICE: Only one standard and one draw pattern.

MR. ROSENSTOCK: Right.

MR. STANONIK: Yeah.

MR. ROSENSTOCK: Right. But how do you -- but okay, if I'm going into that hardware store for myself or let's say I'm buying it for my friends or whatever and we have two bins and we say, well -- again, it's a matter of how --

MALE VOICE: How big is your family.

MR. ROSENSTOCK: Well, again --

MR. STANONIK: I mean, this, you know --

MS. ARMSTRONG: That's not an issue for the standards, though.

MR. STANONIK: Well, it's --

MR. ROSENSTOCK: It's not an issue for the standard, no question about it, again, but Hampton is here and I'm just trying to think down the road that --

MR. NEWSOME: Well, that's the question that's, that, you know, we're talking about in terms of how do you communicate that on the label. How do we change the label to communicate these bins and what they mean and what these terms mean?

MR. ROSENSTOCK: I mean, my thought, and I submitted this to DOE, was, well, to make it easy for everybody, just stick with the medium draw pattern to kind of be somewhat analogous, but if that's not possible, then, you know, again, I think there will be

confusion if different water heaters have different ranges based on different draw patterns.

MR. BROOKMAN: So Frank, and then to this gentleman here.

MR. STANONIK: Frank Stanonik, AHRI. But, Steve, but really the fundamental principle for the water heater industry always has been if this is going to be done properly, the consumer first should figure out what size water heater they need, and then you go look for the products that can satisfy your need and not go the other way and say, well, what's the biggest one or what has the lowest cost of operation or whatever.

I mean, from the very beginning we've always taken the approach, okay, look, you need to figure out what size you need and then, once you know that, go look at what efficiency level you want to get for the product you need. That hasn't changed. This, if we get this all right, this may help that.

MR. BROOKMAN: Yeah. Yes?

MR. CARNEVALE: I think this -- Bruce Carnevale, Bradford White. I think, to address Steve's concern about confusion, during the comment period on the test procedure I think there was unanimity amongst the manufacturers that there should

be some distinction for the UEF, what it is called, with respect to what bin it goes into, because right now, to your point, there is a little bit of confusion. You have the same terminology for products that could be in different bins. What AHRI has proposed is to put that range of comparability so that you're only comparing products in the same bin, which is determined by the first-hour rating or the GPM if it's a tankless. So that takes away some of the confusion.

But I would still argue that it would be helpful to have some distinction so that it's more prominent for the consumer, that they can see, well, this is a little bit different than this because it's a different draw bin.

MALE VOICE: Thank you. Yes. Thanks.

MR. BROOKMAN: Joe?

MR. BOROS: Just a quick comment. I believe AHRI developed a proposal that was shared. Frank, maybe --

MR. STANONIK: I meant to. Yeah.

MALE VOICE: Yeah.

MR. STANONIK: Okay. Yeah.

FEMALE VOICE: Have we sent it to Hampton?

MR. STANONIK: Yes. Yeah. I'll send it to

Charlie. I'll send it to Harvey too.

MR. BROOKMAN: Okay. Okay. So I thought we worked our way through a lot of useful stuff there.

Amy, please.

MS. SHEPHERD: Yeah. I just -- this is Amy Shepherd of AHRI. Just one closeout. If based on comments DOE comes to a conclusion of some path forward where, you know, the certification's not until May, so the inference is that the representations might not be until May, I think what's important is that manufacturers have some certainty in terms of the enforcement.

So, if there is a decision that there will be an allowance for the EF to be used during that period, I think that we need something that says that from FTC, which is charged with that piece of the enforcement in DOE, that it's okay to go forward in that way, because I think that's part of the problem is that there's a lot of uncertainty about this issue.

So if we, once we decide what the path forward is, could have some very explicit guidance in terms of what the enforceability would be would be helpful.

MR. BROOKMAN: Okay. Are we ready to move on now? Yes. Let's move on. And we're going to hear

from Bill Healy, National Institute of Standards and Technology. And for those of you that are curious, we're probably going to work inside say until 12:30 or so and then see where we are based on the content.

And, Frank, you've got quite a few additional slides, correct?

MS. ARMSTRONG: Six.

MR. STANONIK: Six, yeah. I mean, again, we can kind of -- I think that Ashley said maybe hold them until near the end or --

MS. ARMSTRONG: So I would just say this is a good question for you all just in terms of schedule-wise. It is noon or close to it. We can keep going. We don't have a whole lot of slides in terms of -- I mean, we're going to talk briefly about what we said and show some tables and show some equations. We can at least give our portion of the presentation. I don't know if you want to break for lunch or if you just want to keep going, plowing through and hold lunch. We can do whatever you guys like. There's no opinion.

MR. BROOKMAN: Yeah. That was my thought. DOE's -- if you look at the slide packet here, there's very useful information here, but it's not a really thick deck. So I was thinking we'd go through this

and then we assess where we are at that point, okay?

So, Bill, go ahead.

MS. ARMSTRONG: I mean, minus the technical differences that we're going to speak of with regards to the six slides you have in terms of what you guys want us to look at, I think the majority of the discussion in terms of the controversial what we have to do when has been had.

MALE VOICE: I wonder if we could take a five- or 10-minute break.

MS. ARMSTRONG: Sure. Absolutely.

MR. BROOKMAN: A 10-minute break now? Okay, let's take a 10-minute break. Just so you're -- the restrooms are out near the elevator core. And the door over here is open for when you want to reenter. And there's a water fountain right over here, outside the door over here to the right-hand side on this corner over here if you want to grab some water, okay? So 10 minutes and then we'll resume.

(Whereupon, a short recess was taken.)

MR. BROOKMAN: We're about to resume. And we're going to hear from Bill Healy, NIST. There ought to be a microphone there, right?

MR. HEALY: Yeah. It's covered up, so --

MR. BROOKMAN: Are we all set, ready to go?

MR. HEALY: Yeah.

MR. BROOKMAN: So do you have the advance thing?

MR. HEALY: I'll just use the arrow key.

MR. BROOKMAN: Okay.

MR. HEALY: Okay. So we're going to talk about the getting more depth on the technical aspects of the conversion factors. I will start out with talking about the models that DOE tested and what considerations there were for selecting these.

In selecting these units, we based it on a lot of the comments we received at RFIs and the final rules of the test procedure. So these are the issue -- these are the properties considerations for test selection.

So one was the NOx emissions. It was pointed out we should look at standard low or ultra low, venting type for gas, atmospheric or power vent, short or tall units, whether a gas unit has a standing pilot or whether it has no standing pilot, and also whether there's a condensing unit or a non-condensing unit.

We also attempted to test a range of models from across the product offerings. Some of the things we show here are the rated storage volume, any input

rates, first-hour ratings, a max GPM of the currently rated units, recovery efficiencies and energy factors as best we could, and then a range of thermal efficiencies and standby loss for the residential duty units.

So this plot is just an example. I don't want to get in too much depth on this, but this kind of shows you in terms of what the basic models are on the market and what we ended up testing. So, once again, just as an example to show that we tried to represent as best as possible what is on the market in terms of basic models.

So, for example, on the left one, the left two bar charts, it shows green on the basic models that are ultra-low NOx. The red is the low NOx, and the blue is the standard NOx rating. So that's the percentages on the market. The ones that we tested are the next bar chart. So all of those -- you know, I don't want to go through each one of these bar charts, but that tries to show you that we were somewhat representative, tried to be representative, in the models that we tested.

So we tested a total of 72 water heaters, and this chart here shows you the breakdown of those water heaters, consumer storage, gas/oil, electric

resistance, and heat pump units, consumer instantaneous units, gas-fired, and electric, and then residential duty we tested gas-fired units.

Okay. So, once again, these conversions, these tested units were those that are covered by the existing test procedures covered by the new UEF test procedure.

MR. BROOKMAN: Do we have questions or comments before we move to the next section?

MS. SHEPHERD: I have a question.

MR. BROOKMAN: Amy.

MS. SHEPHERD: This is Amy Shepherd with AHRI. So in the number it says that this focused on models that met the April 2015 standards. So did all of these meet those standard levels, or can you give us a breakdown of --

MR. HEALY: They all met the existing standard, the April 2015 standard.

MS. SHEPHERD: So it wasn't just focused -- they all met them.

MR. HEALY: Yes.

MS. SHEPHERD: Oh, and now when did you do this -- I'm sorry. Amy Shepherd again. And what was the time frame for this testing? When did it --

MS. ARMSTRONG: In the past year.

MR. HEALY: Past year, yeah.
MS. SHEPHERD: So, okay.
MS. MEYERS: So this is Karen --
MS. ARMSTRONG: Since the test procedure was finalized.
MS. MEYERS: Where were these units tested at?
MR. HEALY: There were multiple labs at which they were tested at.
MS. MEYERS: Such as?
MS. ARMSTRONG: Cortland. Same places you test, no difference.
MS. MEYERS: And so the labs were -- all met ISO --
MS. ARMSTRONG: Yes.
MS. MEYERS: -- 17 and 25?
MS. ARMSTRONG: It's all the labs you use. It's no different. You know the same labs we use.
MR. BOROS: Let me just -- Joe Boros here. I'd like to clarify the question. You indicated that all the models met the 2015 that were tested? Of gas or electric, or what are you -- because the --
MR. HEALY: Yes.
MR. BOROS: -- the data says otherwise. So I'm just trying to clarify which categories you're

referring to when you --

MS. ARMSTRONG: So all the models had ratings that would show that they comply with the new standards.

MALE VOICE: Was the point of 15, yes.

MR. SACHS: A current rating.

MR. BOROS: There are several models. And I don't know if you want to get into all the data here, but -- that would comply to the previous level, right? For example, electric, there were several --

MR. HEALY: Once again, they were rated to meet the 2015 standards, and that's the measured data.

MR. YORK: Certified?

MS. ARMSTRONG: Well, it's the certified data.

MR. YORK: Thank you.

MS. ARMSTRONG: Not necessarily the single measurement, though.

MR. CARNEVALE: Bruce Carnevale, Bradford White. What date did you do this testing or what dates?

MS. ARMSTRONG: So it was between July when we finalized the test procedure, so July 2014, over the past year to current.

MR. BROOKMAN: Frank Stanonik.

MR. STANONIK: Frank Stanonik, AHRI. So I guess the first question. So different units were tested at different facilities. Were units of a single fuel type all tested at the same facility, or that also varied?

MS. ARMSTRONG: Most of them were all tested at the same facility. There were some units that were tested a couple times at the facility, the same unit.

MR. STANONIK: All right. So the real question or a bigger question is if -- so some units were tested at different facilities. Did the analysis attempt to factor in the laboratory variability of the test results?

MR. HEALY: No. So for the most part, the tests were done -- well, the tests were done, old test procedure, new test procedure, in the same facility.

MR. STANONIK: Oh, okay.

MS. ARMSTRONG: So the delta. So we --

MR. STANONIK: Okay.

MS. ARMSTRONG: Every unit we pulled we tested for current test procedure and new test procedure.

MR. STANONIK: Right.

MS. MEYERS: So this is Karen with Rheem. So does this -- this is you tested 72 units. Does

that mean you ran 72 tests?

MS. ARMSTRONG: No. There are 72 individual models.

MS. MEYERS: But did you test like each model twice, like we're required to do when we certify a model or did you --

MS. ARMSTRONG: No.

MS. MEYERS: So you only --

MS. ARMSTRONG: And you're not required to test each unit twice. You're required to test two units or more per model.

MALE VOICE: Yes.

MS. MEYERS: All right. So --

MS. ARMSTRONG: So no. What we have -- we compared single-unit tests to single-unit tests, one to one. It's not ratings. We didn't compare rated values to single-unit tests, and we didn't compare rated values to new rated value. We compared single-unit tests to single-unit tests.

MS. MEYERS: And only one test was run on each --

MS. ARMSTRONG: Single-unit test.

MR. HEALY: Well, one -- right. For one energy-factor test, one --

MS. ARMSTRONG: Right.

MR. HEALY: -- UEF test on the same exact unit --

MS. ARMSTRONG: Right.

MR. HEALY: -- was the equivalent.

MR. BOROS: I would draw your attention to CS-10, CS-8, and CS-7. Are they in fact 95 or 94 combined water, the rated water heaters that were tested?

MS. ARMSTRONG: I'll look. I don't have it in front of me.

MR. BOROS: Is that -- for example, CS-7 --

MR. BROOKMAN: What are you referring to there, Joe?

MR. BOROS: This is the --

MALE VOICE: The test model testing notes.

MR. BOROS: -- Milburn type date.

MALE VOICE: Stapled 8/13.

MR. BOROS: For example -- and I don't mean to be picking on data, but CS-10 was tested with .902. CS-8 was .901, and CS-7 was .855. Are these truly certified to 95 or 94?

MS. ARMSTRONG: I will look. We'll look at it.

MR. BROOKMAN: Okay. We'll dig that out. Additional questions for Bill on this segment before

we -- yes, Charlie.

MR. ADAMS: We voted, and I was out of the room. I apologize if it's been addressed. Charlie Adams, A.O. Smith. The question, it's been raised on the seven residential duty units that we have a warrant is -- are we missing something there?

MR. HEALY: Those are rated at residential duty. We would welcome input on any problems in the testing because it was measured so that the data that was shown in the NOPR was what was measured, so they were rated as residential duty in terms of any difference.

MS. ARMSTRONG: Right. So they are rated above 75 and when they measured in the lab they come out lower. So we could have thrown out orifices. We could have added some burners. We didn't, but maybe we should have.

MR. ADAMS: Okay.

MS. ARMSTRONG: So if you think we should have and we should retest and that would have an impact, we can do that.

MR. ADAMS: Okay. A follow-on question.

MS. ARMSTRONG: Yeah.

MR. ADAMS: So, on Table 322, residential duty, commercial storage water heater attributes, RB4

is show as yes, condensing, but the vent type is atmospheric. I need some clarification because --

MS. ARMSTRONG: Yes.

MR. ADAMS: -- would atmospherics work because hot air rises, and condensing units don't have hot air to rise?

MS. ARMSTRONG: I got it. We'll look at it.

MR. BROOKMAN: We don't have it yet. Joe.

MR. BOROS: Just a followup question to that. Maybe I misunderstood you, but there was one unit tested to represent a model, or were there two units tested of each to represent a model?

MS. ARMSTRONG: One to --

MR. BOROS: One?

MS. ARMSTRONG: I'm not using rated values, right? I'm not trying to come up with what the rating would be for that population of that model. That's what you guys do when you come up with your cert.

MR. BOROS: Right.

MS. ARMSTRONG: I did a single-unit test compared to a single-unit test for 72 models.

MR. BOROS: I understand that.

MS. ARMSTRONG: Yeah.

MR. BOROS: You're almost just basically auditing a product with a single unit.

MS. ARMSTRONG: In theory. But I'm not trying to come up with a rating -- a rated-value conversion to a rated -- because there's a lot of things that go into your rating that are beyond just the results of your specific test, right? So that's why perhaps a test to test is a better comparison.

MR. BOROS: Well, I would --

MS. ARMSTRONG: And you all do your ratings differently.

MR. BOROS: Well, I would think that if we're trying to develop a correlation factor or a methodology that we would use more samples to generate a higher degree of confidence.

MS. ARMSTRONG: Right. And like I said, from day one, we welcome your data, and we were pleased to see that AHRI provided data about 10 days ago or so. So that's great. We have a slide on that, and we need some more information from that data to be able to accurately pull it into the analysis, at least in the right format for which we've already done.

But I think part of this is we welcome any data that you guys want to provide, confidential or otherwise, to be included in this analysis. And we're happy to provide you with a format for which all the different fields that we would need to be able to

include it in the right bins and in the right buckets and respond to some of your questions in the right manner, because the way it's -- and we can get to this. We're jumping to the very last slide of our presentation almost. But the way it's been provided thus far, it does have some very helpful information and to an extent can be used in analysis. But it's not aggregated with model characteristics to the level of analysis that you guys are seeking, especially with regards to the comments you are presenting today.

MR. BROOKMAN: Frank.

MR. STANONIK: Frank Stanonik, AHRI. I just want to jump back one second on the residential duty table. So those input rates were the measured input rates during the test.

MR. HEALY: That is correct, yes.

MR. STANONIK: Okay. Test procedure I think still requires that when you run the test, the unit has to be within plus or minus 2 percent.

MS. ARMSTRONG: Yeah. So that's why I brought that up. That's why I said we could retest them, but what we were saying is as shipped --

MR. STANONIK: Okay.

MS. ARMSTRONG: I'm not sure it would come out that much differently, but --

MR. STANONIK: Well, okay. But, well, in fact, there's a bigger question, though. So all of the other gas models that were tested, did they likewise just fire the unit as it came out the box, or did they in fact run the test procedure and set it to be within plus or minus 2 percent?

MR. HEALY: We have no evidence that it was --

MS. ARMSTRONG: It needed to be modified.

MR. HEALY: -- modified, correct.

MR. STANONIK: Okay, okay.

MS. ARMSTRONG: So in other words --

MR. STANONIK: Okay.

MS. ARMSTRONG: We can go back and double-check the reports, but we make a note if they had to make changes to any modifications model. And off the tops of our heads, we don't remember any modifications that were necessary right out of the box to satisfy that condition. Those did not satisfy that condition even though they were rated at the correct vent, well, correct loosely.

MR. BROOKMAN: Okay, Bill.

MR. HEALY: Now we're going to dive into the ratings conversion. We'll very briefly go over the mathematical approach that DOE has taken on this. So

the conversions were developed for basically three metrics. So first-hour rating to get a new first-hour rating, to get a new max GPM, and to get a new uniform energy factor.

We examined three different methods as possible ways to get these conversion factors. So the first one is -- I'm calling it a step regression. This is purely data-based. So just take the data we have on these 72 units, do regressions. The reason why we're saying it's a step regression is that we use this technique to evaluate which factors were important. So some factors, if you combine them, they didn't matter and they just complicated it. Some made it worse, the regressions. So the step regression goes through and determines which one eventually becomes the best combination.

The second approach is an analytical approach, so this is purely based on, you know, math and physics of what's going on to try to estimate how this -- how to convert from the old metrics to the new metrics. And the third one is a combination of those. So do a first cut doing an analytical approach using the physics of what's going on and then use the data to fine-tune that model.

To assess these, we use root mean squared

error between the predicted values and the measured values in all cases, and we'll go through that in a second. So a really quick overview of the analytical methods in which we looked at. So for delivery capacity, we did not look at anything for first-hour rating. We decided that there was nothing that we felt was appropriate to predict a first-hour rating, once again, purely from a physics basis.

For the max GPM, though, we did a quick energy balance between the energy in and the energy out at 125 and 135 degrees. So that is the basis of the analytical approach to convert max GPM from old values to new values.

For the uniform energy factor, there's three different ones depending on your water heater type. So first of all, for the consumer storage water heaters, we based it on the water heater analysis model, WHAM, which was published by Lawrence Berkeley National Laboratory as part of a previous rulemaking. So this takes basically the energy out, given whatever your volume, volume per draw is, divides it by the energy needed to create that hot water, plus any standby loss of energy.

For instantaneous method, DOE developed a modified analytical approach since standby loss is not

particularly relevant necessarily for instantaneous water heaters. We attempted an analytical approach, which accounted for the energy it takes to heat the water, plus any energy loss from that water heater as it decayed, as it decayed to ambient after each cycle.

For the residential duty storage, we did something very similar to the WHAM model. We had the thermal efficiency metric and the standby loss metric for the residential duty storage. We used those two metrics to try to project what are the standby losses and how much energy does it take to heat that water.

So further details are in the NOPR. We're not going to go into any deeper details into the equations here, but there are further details in the NOPR.

MR. BROOKMAN: Frank.

MR. STANONIK: Frank Stanonik, AHRI. Bill, I'll look further I guess, but again, in terms of what we're seeing, particularly on the residential duty, I think however you try to convert standby loss to standby loss coefficient may have missed the mark. I'll try, if the details are in there, I'll sort them out, but there's something a bit off on that one.

MR. HEALY: Okay. Thank you.

MR. BROOKMAN: Charlie.

MR. STEPHENS: Charlie Stephens. Yeah, I may take a stab at just sort of suggesting where that is. In a lot of cases in the write-up in the NOPR anyway, you allude to essentially equating the reduction in temperature in the two tests, which you're trying to convert between as 135 to 125, and that really isn't the case.

In the old measurement where you had an average tank temperature of 135, the delivered -- the early delivered tank temperature in that case, especially for taller tanks, might have been 140 or 138, quite a bit hotter, and the water in the bottom of the tank a lot cooler, whereas, you know, the average tank temperature now in that same tank is probably closer to 120, not 135, and if it's delivering 125 at the beginning of the draw.

So not only does that affect standby losses, but you also -- I think if you look at the different draw patterns, where in the old test procedure you're removing -- even in a 50-gallon rated tank, you're removing a quarter of the water in the tank per draw. With some of these other draws, you're just moving a little -- a few gallons of water, and the thing will trip at the bottom, you know, fairly early relatively speaking and recover while the water heater is not

drawing. So you get a -- you know, I think these things have impacts that we've discovered in our own lab testing, and then when you get to heat pump water heaters, it's a whole different thing because how they respond to that is technology-based.

MR. HEALY: I'll just go ahead. It is stated in the NOPR that we did take some assumptions, and we did state that that is an assumption, that the delivered is the tank temperature. And we realize that is an assumption, and we'd like your feedback on how valid that assumption is.

MR. STEPHENS: Okay. I don't think it's valid, and I think it may be somewhat responsible for some of the disparities you're seeing between your tested and your converted values.

MR. HEALY: Thanks.

MR. BROOKMAN: Okay, thanks. Yes, Bruce.

MR. CARNEVALE: Bruce Carnevale, Bradford White. Just to follow up on that, we've also identified an issue because of the change from 135 to 125 and the outlet temperature and the change from 25-degree delta T to 15-degree delta T. In many cases, the differential is not enough so that the upper element turns on, and that has a dramatic impact on the first hour rating beyond what you would expect

just with the stored energy at the higher temperature versus the lower temperature.

MR. BROOKMAN: Okay. Additional comments?

(No response.)

MR. BROOKMAN: Okay.

MR. HEALY: So this says which of these conversion methods were selected. So for most of the UEF conversions, we went with the combined analytical and regression approach. We feel the analytical approach captures most of the underlying physics, and some of the things that you guys have just mentioned here, we feel like the regression will hopefully account for some of those other factors that the pure analytical approach was not able to handle.

For the heat pump UEF conversion, we used the regression method, and the reason why is that we are basing all of these conversions on commercially available information. So the recovery efficiency values that are available on the AHRI database for heat pump water heaters are their recovery efficiency for the electric resistance element, so we don't think that's representative of how a heat pump water heater operates. So for that one, we based it purely on a regression method, so we regress the data that we had to come up with the UEF conversion.

For the first hour rating, we used a regression method only. As I mentioned before, we did not look at an analytical method for first-hour rating conversions.

For consumer units, we used the existing first-hour rating, and for the residential duty we used the existing input rating. Or -- right. There were certain cases where we looked at the different equations, and the RMS value -- once again, that's the root mean squared error -- was very close between alternative types of regressions. And there might be some cases where the RMS of a different combination of parameters may look a little better, but we decided to go with maybe a simpler version or an alternative version that we felt better representative.

In all cases, those differences were less than one gallon, so we feel like it was within the noise of the data and the regression, the uncertainty of the regressions.

For the maximum GPM conversion, once again from the old metric to the new metric, we used the analytical method only.

Frank?

MR. BROOKMAN: Yes, Frank.

MR. STANONIK: Frank Stanonik, AHRI. Okay.

So on the heat pump UEF conversion -- okay. But you did test heat pumps, so why wouldn't you have used the recovery efficiency value you got in your tests to inform your conversion estimate?

MR. HEALY: We want the conversion factor to be -- anyone could use it with publicly available data. Since we didn't see the publicly available data on a heat pump water heater, we didn't want to impose that as the conversion factor. Yes, we could have done it if you measure it, but we wanted somebody --

MR. STANONIK: Frank Stanonik, AHRI. As an aside that maybe can be addressed at some point, we are reporting the .98 because in fact the template at the moment doesn't let us put in 240 or 380 percent or whatever.

MR. HEALY: Okay.

MR. STANONIK: Because the recovery efficiency of a heat pump would be basically at COP, which is going to be, you know, multiples of 100 percent. And basically right now I think in the format, in the template, we can't put in anything above one I believe.

Right, Mike? Is that --

MS. SHEPHERD: I'll look at it.

MR. STANONIK: I'll double-check them. I

think I remember us having that discussion back at the office, what do we do.

MS. ARMSTRONG: Why didn't you ask us?

(Laughter.)

MS. ARMSTRONG: I mean, just saying. Panel that. We'll leave it at that.

MR. STANONIK: Yeah. That will be a separate discussion.

MS. ARMSTRONG: Okay.

MR. STANONIK: Yeah.

MS. ARMSTRONG: Look forward to it.

MR. STANONIK: Yeah. I have lots of hats. That's not one of them.

(Laughter.)

MS. ARMSTRONG: Me too.

MR. HEALY: So this is not -- this slide is not meant as an eye chart and not to get through every one of the digits, but I just wanted -- we just wanted to give you a flavor of what the conversion factors look like and how they're breaking out.

So for consumer gas-fired storage water heaters, we found the need to separate these conversion factors, whether or not there is a condensing unit or non-condensing. For non-condensing, furthermore, we felt like the regressions

were better when you're looking at different NOx levels.

So for consumer gas-fired water heaters, there are four different conversions. You can see that the first-hour ratings are functions of the former first-hour ratings. Or, I'm sorry, the new first-hour ratings are a function of the existing first-hour ratings, and the UEFs are a function of the analytical model, which we're calling UEF WHAM. So that's the analytical conversion, and then you do a regression on top of it.

For the oil-fired, we have the one equation as shown. For consumer electric water heater, DOE proposes to separate it out between electric resistance and heat-pump water heaters. And there's also a conversion for tabletop water heaters.

MR. BROOKMAN: Charlie?

MR. ADAMS: What was the thought process that got you to separate standard NOx and low NOx? Was it scattering the data, or was it some underlying assumption you made going in?

MR. HEALY: When we looked at -- we did not group standard and low together. I heard Frank's discussion or comment earlier on that. So we separated the three out. And we looked at these

equations that we've developed and compared to the measured data, and we felt that based on the RMS errors between these predicted new UEFs and the measured UEFs were better if we separated out by NOx levels as opposed to grouping all three together.

MR. ADAMS: I agree all three don't belong together.

MR. HEALY: Yeah.

MR. ADAMS: But the standard and the low, I guess I'm surprised to see you found a significant enough difference to separate them out.

MR. HEALY: We looked at it either grouping them all together or grouping -- or doing all three. So we welcome your comments.

MR. ADAMS: All or none is what --

MR. HEALY: We welcome your comments on which one would be better for coverage.

MR. STANONIK: Frank Stanonik, AHRI. I think, I mean, the way we looked at that, the standard and the low NOx still have basically the same burner. The ultra-low NOx has a radically redesigned burner we think would cause difference.

MR. HEALY: Okay. Thank you.

MR. BROOKMAN: Jim Lutz has a question. Jim, you should not be on mute. Let's hear from you

and hope we can hear you in the room.

MR. LUTZ: Do you hear me?

MR. BROOKMAN: Yes. Speak up.

MR. LUTZ: Oh, good, good. The conversion from -- for first-hour rating, it -- when you do -- you did -- you tested under the energy factor. You got a -- I mean first-hour rating on an energy factor. You got a first-hour rating under the UEF test, and you came up with first-hour rating via the regression method and the forward UEF. And then you used -- the way I understand it, you used the regression of the first-hour rating to determine which category -- which draw pattern to use.

MR. HEALY: Yes.

MR. LUTZ: Is that -- and then my question on that is if you look at the draw pattern that's determined by the first-hour rating for the consumer storage model, there were, when I looked through the data, there were nine of them that came into a different draw pattern using the regression FHR than the tested FHR. And I'm thinking that might actually cause some problems, that you'd get a very radically different answer because you tested under a different draw pattern than you should have. I just wanted to point it out, seeing things and not understanding

what's going on or --

MR. HEALY: We tested the UEF to the measured first-hour rating, measured and new first-hour rating.

MR. STEPHENS: Does that include the measured new tank volume?

MR. HEALY: The measured new --

MR. LUTZ: That wasn't my question. My first question is when you get a -- when you want to do the conversion, you do -- you come up with what the first-hour rating is under the new test procedure. But if you actually ran the new test procedure for nine of the consumer storage, you end up with a first-hour -- a tested first-hour rating that puts you in a different category than the regression first-hour rating would.

MS. ARMSTRONG: Okay.

MR. HEALY: And what's -- and is there a question or other comment?

MR. LUTZ: If there's an easy way I can quickly turn from the slides, I'd be able to do that.

MS. ARMSTRONG: I think we get the point. We just have to look into it. It's not an issue.

MR. STEPHENS: Well, yeah. And I want to to Jim's point, I also want to add that if you're testing

the first-hour rating for the UEF test procedure, the volume that's in that -- the volume of water you're actually working with is whatever is actually in the tank regardless of the rated volume. So that will possibly give you a different error in your equations if you're not using that same volume.

MS. ARMSTRONG: So you would argue using measured volume throughout.

MR. STEPHENS: Yeah, because you're going to get a different calculated number if you're not using the measured volume from the test when you're trying to compare to the test results.

MR. HEALY: Once again, we're looking at the conversions right now, so I'd ask you to reassess whether the storage volume comes in. And I don't --

MR. STEPHENS: I'm looking at first-hour rating here, just volume 125 over volume 135.

MR. HEALY: That's the max GPM I believe.

MR. STEPHENS: Yeah, 1.147 and -- yeah, you're looking at the temperature differences, which are not correct either. So it's not 135 minus 58 and it's not 125 minus 58. I think I commented on that earlier. So these equations build up from the bottom, and I think you've got a series of things that will lead you inevitably to where your tested values will

be at odds with your calculated values if you're not using apples and apples in your equations.

MR. HEALY: Yeah. And I appreciate your comments. Please submit them. But also realize that V could be either storage volume or delivered volume per day. So just -- I'll just ask you to make sure --

MR. BROOKMAN: Charlie.

MR. ADAMS: Charlie Adams, A.O. Smith. I used to be a real engineer, so I'll defer to the real engineers who are in the room. But the first-hour test today from the EF is based on actual tank volume, not on rated storage volume. So the first-hour rating has always been based on how much physical water is in the tub.

MR. STEPHENS: I know. I just want to make sure the equations have that same number in there too when they're trying to do a calculational equivalent and measuring it to that very same test or comparing it to that tested result.

MR. BROOKMAN: Yes, Joe.

MR. STEPHENS: And the delivery volume is, as Jim pointed out, based on the draw pattern.

MR. BROOKMAN: Okay.

MR. BOROS: I have a question on test sample size. For the ultra-low NOx category there, non-

condensing, I see that there was -- it's described that there was only four models tested. So is that a significant sample size to generate an equation like that and then the conversion equation, and then also is that a significant sample size to actually set a minimum standard based on four tests? Are we recognizing that the market has hundreds of thousands of ultra-low NOx models? And there's probably 10, 20 different types and styles of water heaters within that category.

MR. STANONIK: Hundreds of thousands?

MR. BOROS: Well, how much is it, Frank? Ultra-low NOx--

MR. STANONIK: Ultra-low NOx?

MR. BOROS: What's the market size?

MR. STANONIK: Not hundreds of thousands of models.

MR. BOROS: No. Hundreds of thousands of units sold.

MR. STANONIK: Oh, okay.

MR. BOROS: And there is --

MR. STANONIK: I thought you said models.

MR. BOROS: No. There's hundreds of thousands of units sold. Let me clarify. And there is probably at least, what, a dozen different styles

of water heater, different designs out there from different manufacturers?

MS. ARMSTRONG: Right. So I think what you're seeing from us -- and, you know, I'm going to sound like a broken record at this point. I've told a number of you this at a variety of different places, but we would welcome your data. I mean, if you want it in there -- that's not to say that, you know, DOE did test a fair number of models for this exercise. Perhaps you could argue that we need to have more in certain categories and we need to have models with different attributes. We didn't get them all. And you can point out specific models that you'd like us to test, or you are more than welcome to provide us specific test data that you want us to consider.

We're completely open to doing that, and we stated that a number of times throughout the past year. I don't think it's realistic that DOE is going to test every model out there. But we did do a fair amount of testing for this rule in the limited amount of time we had.

MR. BROOKMAN: Frank.

FEMALE VOICE: Well, let Bruce go first.

MR. STANONIK: Frank Stanonik, AHRI.

MR. BROOKMAN: Hold on. Hold on. Bruce,

you want to go first?

MR. CARNEVALE: Yeah.

MR. BROOKMAN: Okay.

MR. CARNEVALE: I hear your frustration, Ashley, and I feel for you, as you know from our previous conversations.

MS. ARMSTRONG: Yeah.

MR. CARNEVALE: Understand what this industry has just gone through. Don't interpret that we haven't submitted gobs of data as we don't want to help. Interpret that as we've just gone through one of the most massive changes this industry has ever gone through, and all of our resources have been tied up to meet the April 15 NAECA-3 requirement. And the timing of this has been very challenging not only for you but for us as well.

MS. ARMSTRONG: No, and I completely empathize with that, but I don't think it's fair to also --

MR. CARNEVALE: And back to Harvey's point, and you know where I stand on this. This is not the normal rulemaking process. You have some handcuffs on you because of the statutory requirement --

MS. ARMSTRONG: Yeah.

MR. CARNEVALE: -- or multiple statutory

requirements. We did not support AEMTCA. We were looking for a simplified version that would be technology blind. That's not what happened. It's morphed into something incredibly more difficult and challenging. And I feel for you. We also have lots of issues with this that are coming out.

MS. ARMSTRONG: Yeah.

MR. BROOKMAN: Karen.

MS. MEYERS: So I'm just going to push back on that DOE tested several models. I think 72 models, one, you know, out of a market that's averaged over 8 million water heaters per year over the last five years is not a significant sample. DOE requires manufacturers to do significant testing on every model that we introduce. And the burden is on DOE. We're trying to help, but the fact that this analysis is so far off, to me, the burden is now coming back on manufacturers to do this. And I think as part of the rulemaking what Congress told DOE to do was to come up with an adequate -- and how you can think 72 models is adequate to come up with a valid rule is beyond me.

It should not be the burden of the manufacturers to have to provide all of this information, but that's what's happened. So I do not agree that DOE did a lot of testing on this rule. I

think you did a woefully inadequate amount of testing on this rule, so I'm pushing back on that one. So I'll be quiet.

MR. BROOKMAN: Okay. Other comments here? Frank, do you have another comment here?

MR. STANONIK: Frank Stanonik, AHRI. I just want to mention, listening to Ashley, that, yeah, in -- related to Joe's question, I think in the case of the ultra-low NOx, definitely -- and I was looking at what we've provided. There needs to be some more information on ultra-low NOx models with higher inputs. All of yours were right around 40,000, you know. And again, talking about the variety of models that exist, and maybe even I have to look at the venting situation. And I looked. We have some that have higher inputs, but that becomes a big factor. So I think that needs -- one of those areas we need to look a little closer, or look at more models.

MR. BROOKMAN: Neil McDonnell, who is joining us online, has a question and a comment. Neil's question is, "Was the draw usage statistically significant in the regression? If so, wouldn't the conversion factor be different for different draw/usage patterns?"

MR. HEALY: I'm struggling to understand the

question.

MR. BROOKMAN: Want me to read it again?

MR. HEALY: Yes, please.

MR. BROOKMAN: The question is, "Was the draw usage statistically significant in the regression? If so, wouldn't the conversion factor be different for different draw/usage patterns?"

MR. HEALY: So I think the question is should these be broken out by different draw patterns --

MS. ARMSTRONG: Yeah.

MR. HEALY: -- I think is the question. We found that we feel like this is the best approach, you know.

MS. ARMSTRONG: We didn't feel like that level of detail was necessary.

MR. HEALY: Right.

MS. ARMSTRONG: But obviously we welcome comments on that.

MR. BROOKMAN: Okay. So, Neil, please --

MR. HEALY: That's right. I would say also thank you. The WHAM, we feel like the WHAM equations account for the different draw pattern sizes.

MR. BROOKMAN: Okay.

MR. HEALY: Thank you.

MR. BROOKMAN: Yes, Charlie.

MR. ADAMS: A clarifying question way back in the last topic. I'm sorry. I apologize. I didn't ask all my questions. On Table 3.22, where I asked about the condensing atmospheric, there is also a column -- the right-most column says standing pilot or electric ignition, and the entries in that column are yes and no. Does yes mean electric ignition and no means standing pilot?

MS. ARMSTRONG: Got it.

MR. HEALY: We'll have to check that. Sorry.

MS. ARMSTRONG: So, Frank, just to go back to one thing you said earlier.

MR. STANONIK: Okay, yeah.

MS. ARMSTRONG: We just played around with the template, and we can definitely enter values above one for recovery efficiency. You guys should have no issue if you're using our template online.

MR. STANONIK: Then I have to go back and talk to our people, okay?

MS. ARMSTRONG: Yeah.

MR. STANONIK: Maybe it's all mixed up. I don't know.

MR. BROOKMAN: Okay, Bill.

MR. HEALY: So the next slides show some conversion results that we found based on our test data. You can see that in your slide deck. So on the X-axis is the actual measured first-hour rating for consumer storage units. On the Y-axis is the regression value that we found. So a perfect correlation would fall on that solid line, so that would mean the measured was exactly what the regressed new value is. So this is what we found for consumer storage first-hour rating. The next slide shows the uniform energy factor. Question for Harvey?

MR. SACHS: This is Harvey. I'm going to rant. I have spent a little bit of time across a bunch of fields arguing that this particular formulation always makes data look much better than they are, and the appropriate approach is not FHR versus FHR but the anomaly versus the volume.

What I'm interested in, the data, are the difference between the new regression and the measured, not the correlation. So I would like to see the -- since I don't have the data, I'd really like to see -- I mean, I see some deltas that are in the 15 percent range and a lot of them that are much smaller. I can't really use this, this depiction.

MR. HEALY: The data are available. I know

you're not going to be able to crunch it right now, but the data are available.

MR. SACHS: End of rant.

MR. HEALY: Thank you.

MR. BROOKMAN: Charlie Stephens.

MR. STEPHENS: Charlie Stephens. As Jim Lutz pointed out, there were nine models that he found in the data where the disparity was large enough to put them in a different draw pattern category. So, when you moved on to utilize the FHR results, how did you deal with those nine that had a different calculated FHR than measured?

MR. HEALY: We used the measured first-hour rating under the new test to determine which draw pattern.

MR. STEPHENS: Okay.

MR. HEALY: So the measured uniform energy factor is based on the measured first-hour rating.

MR. STEPHENS: Okay. Thank you.

MS. ARMSTRONG: Which you would agree with doing.

MR. STEPHENS: Yes.

MR. HEALY: Once again, this is for consumer storage. We've been down the heat pump, uniform energy factor to a different slide for the scaling

purposes. And I'm just going to go through these. These are available to you. These are the equations that we came up with for consumer instantaneous. So for the new max GPM under both gas-fired and electric was based on the analytical approach, as we said, and the UEF is based on the model, regression to the model.

This is the plot of the new measured max GPM on the X-axis and the analytical approach on the Y-axis. And then the next slide is the UEF, the measured on the X-axis and the analytical regression on the Y-axis.

For residential duty, these are the conversion equations that have been derived, so they are based on the input rate Q, and then the UEF is based on that analytical approach that we discussed, sort of a modified version of the WHAM. And the data are shown here. So this is the first-hour rating. And the next slide is the uniform energy factor.

MR. BROOKMAN: Frank.

MR. STANONIK: Frank Stanonik, AHRI. Can you go back to Slide 26 for a minute? I very likely might be being a little dense on this one. Okay. So we've got this wonderful regression, analytical regression, UEF. And I'm going to look at just at the

kind of yellow square boxes. So, if I did that exercise just for the low NOx results here, I don't see how I get the line that you're getting. It seems to me I'd get a very differently sloped line.

MR. HEALY: We can research that. Yeah, also consider the fact that there are some yellow boxes that have Xs over them.

MR. STANONIK: Yeah.

MR. HEALY: That they are included in this correlation.

MR. STANONIK: So, okay, so if we took just the yellow boxes with Xs or not Xs and ran this analytical regression, I'd get the same line?

MR. YORK: Did you not say the line only represents perfect correlation and doesn't represent the equation you proposed?

MALE VOICE: That's not a regression.

MR. STANONIK: Oh, okay. That's -- yeah, I'm sorry. Thank you.

MALE VOICE: Okay. Thank you.

MALE VOICE: The lines -- you're right.

MALE VOICE: Yes. Thank you.

MR. STANONIK: Well, why is it there now?

(Laughter.)

MR. STANONIK: All right. Okay. All right.

Sorry.

MR. SACHS: Frank, that's to draw your eye so you don't look at anything else.

(Laughter.)

MS. ARMSTRONG: We were trying to finish this meeting before lunch.

MR. BROOKMAN: Charlie.

MR. STEPHENS: Charlie Stephens. Just -- this is an esoteric question. Did you make any attempt to figure out what the anomalous number examples were, what was causing the rather radical departures between some of them?

MR. HEALY: Data were reviewed pretty thoroughly. I will say that. So, from the private labs, they provided the data, and it was combed pretty, pretty rigorously. There were a lot of tests that we asked for, you know, that were not included. So we feel like we captured any anomalies that may be going on in the test data from our review.

MR. STEPHENS: Yeah. I mean, I would try to explain it also just by the nature of the water heater being tested and whether it is different than others in the way it responds to the new test procedure versus the old and whether it's -- how relevant its old EF really is to the new UEF test, and maybe it

isn't.

MR. HEALY: There were no rigorous studies done like that.

MR. STEPHENS: Oh, okay.

MR. HEALY: So now we're going to go into the energy conservation standard. So that was all based on just the conversion factors from old metrics to new metrics. The approach taken here was the so-called percent different method -- the percent difference method. So we looked at every unit on the market. We applied the conversion to every single unit, so we had publicly available data on every unit. We applied that conversion to get a new UEF value. So basically, first we figure out which bin it would fall under under our first-hour rating and then get a new UEF value.

For that model, we determined what was the current minimum energy factor or minimum thermal efficiency for every unit on the market. We then found the percent difference between that unit's energy factor, minimum energy factor, given its volume. We also did the same for thermal efficiency for the residential duty units.

What we then did is we computed an associated minimum UEF which was the same percentage

below our new UF value that we determined. And I will have a slide here next which hopefully will describe this a little bit more. And then we found a line through the minimum UEF values.

So I'm going to just go to the next slide to kind of describe this a little bit more. So this is one example. So this is consumer storage gas, medium draw pattern. So this shows all the units that we noticed that would fall under that medium draw pattern. The yellows are what we converted would be their new UEF.

The green dots show the percent -- so given that energy factor is a certain amount above percentage-wise its minimum energy factor for that volume, we then determined which -- the green points would correspond to that UEF, which would be the minimum value, the same percentage below that the energy factor minimum is above the measured rated energy factor.

Then what we did is we found the lowest points, those lowest green points, and we fed a line through it. And that's how we determined these relations between the minimum standard, minimum UEF, and storage volume.

MR. BROOKMAN: Frank.

MR. STANONIK: Frank Stanonik, AHRI. So, Bill, first of all, so you looked at, in this case, you looked at all consumer storage gas models that would fit into the medium draw.

MR. HEALY: All of them, right. Yes.

MR. STANONIK: All units, all models. Okay. And then you -- okay. Then you converted, and then you tried -- I guess I'm trying to figure out here, if you only looked at models, currently rated -- I'm sorry. If you only looked at models rated to the current minimum -- as an example, let's say that -- well, this is medium use. Let's say that the minimum is either -- I'm trying to remember now. Let's say either .62 or .60. That probably covers most of them. If you had picked only those models that hit that minimum, that were rated at the minimum, and were in this bin, would we get a different result?

MR. HEALY: We had concerns that combinations of different UA values, thermal efficiencies -- in that case, water heaters that are -- if we didn't look at water heaters above the minimum, that there might be a situation where that water heater would fall below the minimum and would then suddenly become noncompliant if we only looked at the minimum -- the minimally compliant energy factor

ones -- we were concerned that there would be cases where higher ones would fall below.

MR. BROOKMAN: Charlie.

MR. STEPHENS: Just a quick question again. Again, explain the derivation of the UEF and minimum UEF numbers.

MR. HEALY: Sure. And I admit that it's --

MR. STEPHENS: Just in simple terms.

MR. HEALY: Sure. So if we looked at a plot of, say, a given water heater, so one set of yellow and green -- and does this pointer work if I do this? So let's look at a yellow dot and its corresponding green dot. So those are -- those two points are for the same water heater model.

MR. STEPHENS: Right.

MR. HEALY: If we look at the energy factor ratings, this yellow dot here would be a certain percentage above its minimum required efficiency.

MR. STEPHENS: So the tested EF would be a certain amount above its minimum required EF percentage --

MR. HEALY: You rated the certified energy --

MR. STEPHENS: Certified value is so much above the minimum required value, so much percentage

above.

MR. HEALY: That's correct.

MR. STEPHENS: And its tested EF, your tested EF?

MS. ARMSTRONG: We didn't use that here.

MR. HEALY: This is all unrated.

MS. ARMSTRONG: This is always unrated. We used the conversion of rated.

MR. STEPHENS: So this is all -- okay. And so -- and that -- but I'm more interested in the UEF. So I understand the EF part of it. But when you did UEF, what's the yellow? Is that tested?

MR. HEALY: This is -- no. This is converted from a data point, rated value. This is converted from rated energy factor and first-hour rating --

MR. STEPHENS: Okay.

MR. HEALY: -- into a UEF.

MR. STEPHENS: Okay. So you took the rated EF, used your conversion factor to get a UEF, and then compared that to the converted minimum.

MR. HEALY: Right. So that the green dots are the same percentage below the new UEF as the minimum energy factor is.

MR. STEPHENS: Right, right, okay. I got

you.

MR. BROOKMAN: Charlie.

MR. ADAMS: Charlie Adams, A.O. Smith. The population of consumer storage gas that you did all this math on or all -- is everything in the directory or just NAECA-3 compliant? There's a lot of NAECA-2 compliant stuff in here. Is that a correct assumption?

MR. HEALY: I don't -- yeah.

MS. ARMSTRONG: Yeah. Yes, it does.

MALE VOICE: I think it was only ones that are compliant.

MS. ARMSTRONG: Just only ones that would be compliant are in there?

MALE VOICE: Correct. With the April 15 --

MS. ARMSTRONG: But they were on the market, so they would have been on the market over the past year. It's not just all the ones that are --

MR. ADAMS: So there's a whole bunch that weren't on the market until recently.

MS. ARMSTRONG: I know. I knew that's where you were going.

MR. BROOKMAN: Joe.

MR. BOROS: Bill, how did you handle the draw patterns where you didn't have product listed? I

think there's some very small and low bins that may not have product actually listed.

MR. HEALY: Very good question. I'm sorry I didn't address that. So there are situations where there would not be a product for -- let's just throw out an example -- maybe a -- if there was -- if we looked at the various very small draw pattern, there might have been products that fell into that.

In that case, what we ended up doing is we used the analytical approach to estimate the entire population of water heaters, all of them, every volume. We estimated what the UEF would be at that low draw pattern, okay? So then what we did is we fit this line through the minimum UEF that we computed for each one of those draw patterns. So thank you. I apologize I didn't mention that. So in those cases -- the other -- also, if we only had one single data point in a draw pattern, we did the same thing as well so we could generate a line.

MR. BROOKMAN: Harvey?

MR. SACHS: This is Harvey. And to me, the takeaway seems to be that if my product was legal with EF, it's going to stay legal with UEF.

MR. HEALY: That was the intention of this, yes.

MR. SACHS: That's the bottom line for that graph.

MS. ARMSTRONG: Right. And we did it probably in what you could argue is the most conservative way.

MR. SACHS: Okay.

MR. BROOKMAN: Thank you. Please say your name.

MR. YILMAZ: Aykut Yilmaz, AHRI. So just looking at the numbers here, it appears that you're using the rated storage volume as rated per the EF test procedure. So, with the UED, there's going to be a change probably for most of these products. In effect, what the change is going to be is all those green dots are going to move to the left a bit because people will have to claim a lower rate of storage volume. So, if you keep the line where it is, those ones at the bottom are actually going to shift to an illegal UEF rating. So there needs to be some accounting for the impact of the test procedure change and how that determines the rated volume of those products.

MR. HEALY: Thank you.

MR. BROOKMAN: Okay. Thank you. Additional comments here?

MALE VOICE: Good point.

MR. BROOKMAN: Okay.

MR. HEALY: So, as you can see, these are just the way the standards are laid out or DOE is proposing to lay them out. I don't want to read through all this in great detail, but it's by April 15 there was a cutoff at 55 gallons for these. There is very small, low, medium, high, so there's different minimum efficiency standards depending upon which draw pattern this would fall under. And let me just leave it at that.

MR. BROOKMAN: Frank.

MR. STANONIK: Frank Stanonik, AHRI. So this was one of our issues. So based on what I saw in the previous graph and this, these formulas were derived assuming that V sub r is like 30 gallons, 40 gallons, or 50 gallons.

MR. HEALY: Yes.

MR. STANONIK: Okay. And if nothing changes, V sub r will not be 30, 40, or 50, because DOE regulations, it will have to be the average of measurements, and manufacturers -- the solution will be just re-rate the rating. So again, we would like to have some idea what's going to happen with that petition.

MR. BROOKMAN: Okay. Started again. Joe.

MR. BOROS: Joe Boros. Bill, just a follow-up question. So after you completed these equations, did you go and check some products? Back to I think Harvey's question, the intent was to make sure the product that's currently complying would comply under the new levels proposed. So did you check some key water heaters to make sure that that's still a valid --

MR. HEALY: Well, as stated, anything that -- we feel like anything that is currently rated with a given energy factor will be above that standard.

MR. BOROS: Is it verified --

MR. HEALY: That's the way the lines were designed.

MS. ARMSTRONG: Yeah.

MR. BOROS: Was it verified with tests I guess is my question.

MR. HEALY: We did -- we just went by what's rated, assuming that the rated value is --

MS. ARMSTRONG: The answer is no.

MR. BROOKMAN: Bruce.

MR. CARNEVALE: Bruce Carnevale, Bradford White. I understand that on the gas side. What would

that graph look like on the electric side if you need to develop a pattern? Because our data is showing something very much different, where the gas products in many cases the minimum efficiency standard is actually less stringent on the electric side. It is considered to be more stringent, to the point your own data shows that product that's legal to sell today would not be legal to sell once this is implemented.

MR. HEALY: We'd use the same approach on electric.

MS. ARMSTRONG: Yeah. So I'm going to use my words carefully here because I think what you're saying is we pull products from the market today who have certified they comply with the standards today.

When we tested them, as you tested them, I think what is revealed is there's test data that shows that the products may or may not have single test unit results that come back below or above the standard. There's some scatter there.

You know, a single unit test is not how DOE determines whether something complies with the standards. Rated values is a determination by the manufacturer. Both your tests and our tests reveal that there may be a larger issue going on there. I think we're going to leave it at that for this

meeting.

MR. CARNEVALE: Okay. So the data that we've submitted, the new tranche of data that came in on May 14, shows that same sort of pattern --

MS. ARMSTRONG: Correct.

MR. CARNEVALE: -- with not a whole lot of differential, but still out of the 14 units that we submitted data for, nine of them wouldn't meet the requirement any longer where they did currently.

MS. ARMSTRONG: So your data contains a number of dots that fall below the levels both in terms of UEF, but I would argue also in terms of EF.

MR. CARNEVALE: And you didn't find that for gas?

MS. ARMSTRONG: We did not find that for gas.

MR. BROOKMAN: These are the last slides that Bill has, and then we have the slides that Frank has.

Let me note that it's 10 minutes after 1 almost. Shall we pause for lunch or should we press on? Press on? You want to press on? How many want to press on? Show of hands. Not that many.

MALE VOICE: I'm willing to press on.

MR. BROOKMAN: Okay. Let's press on then.

MS. ARMSTRONG: So I think we're pretty much done.

MR. BROOKMAN: Yeah.

MS. ARMSTRONG: Can you go to our next slide for me? So request for additional data. We'll do this one more time just because we all really like each other and everyone loves to hear me talk.

So you did submit data to us. We are grateful for that. We appreciate that. DOE does need some additional detail about those tested units. Given some of the comments you're sending to us, given some of the feedback you've given us today, we need some model characteristics. We don't necessarily want manufacturer name and model number because I know that's something you clearly don't want to give us, but at least some general characteristics of how do we figure out what buckets they fall into beyond what you have given us is going to be helpful for us to accurately input it into our data set of 72.

For any other models that you have been able to test that you would be willing to share with us either confidentially or for the record, we would welcome the opportunity. They need to be submitted by June 15, 2015 to be considered at least initially in what we're doing for the next steps. Our plan right

now is to move forward with a final rule after June, but we will see in light of this meeting what our next steps are after we consider all the comments and after we look in more detail about some of the data you've given us.

MR. CARNEVALE: Can you give us a template which will give us --

MS. ARMSTRONG: Absolutely, absolutely.

MR. CARNEVALE: -- exactly what you need?

MS. ARMSTRONG: I can probably give that to you tomorrow. Sure.

MR. CARNEVALE: Do that through Frank?

MS. ARMSTRONG: Sure.

(Laughter.)

MALE VOICE: That is a hat you're wearing, Frank.

MR. STANONIK: I noticed this.

MS. ARMSTRONG: Absolutely.

MR. BROOKMAN: Yes, Frank.

MR. STANONIK: Yeah. Frank Stanonik, AHRI. Absolutely, Certainly, Ashley, we can give you the additional backup. We have it and we'll give it to you.

I think I mentioned we also have been running comparative tests on all of our water heaters

in the residential program, so we will update the information with whatever additional testing has happened since we took the picture and as close as we can to June 15.

MS. ARMSTRONG: Yeah, and, I mean, to Jeff's point earlier, if you have specific units or designs or new models that you've come out with since April, I mean, clearly when we purchased them we were purchasing models that probably were available prior to April, right? So, if you have new models or if you have new designs or if you have niches where you think DOE should be testing these products or these specific models should be included in the data set, we'll work with you to make that happen, but we need to do that now. We're willing to do that.

MR. BROOKMAN: Joe.

MR. BOROS: Let me just respond to that to say that we have already submitted data to support that effort. And we recognize we need to submit additional data, but the timing is rather short. I mean, we all have businesses to run and we're doing different things, so we're going to make every effort to submit data, but at least from our company's perspective that really doesn't give us a lot of time to do that.

MS. ARMSTRONG: As you know, it's a balance between allowing more time to collect data versus, you know, we do have an impending July compliance date coming up for UED, and that's a statutory date, so we also have a real need to get this done.

MR. HEALY: So -- yeah, Amy, go ahead.

MS. SHEPHERD: This is Amy Shepherd from AHRI. But, I mean, in this rulemaking there's already been statutory dates that have been missed, and so I think from our perspective it's very important that this be correct because this is how the standard's going to be set, in addition to all the other things. So I think, you know, we just feel like we need to push back on that a little bit because it's much more important that this is correct, particularly given the other things we talked about earlier today in terms of this phase-in period where up until May manufacturers won't need to certify these units that have previously been certified to this new metric. So I just can't stress enough that getting the right data and getting the right conversion factor is essential not just for the conversion factor but for the standard.

MS. ARMSTRONG: So that's a good lead-in to does anyone else have any closing remarks they'd like to make at this time?

MR. STANONIK: I have those slides.

MS. ARMSTRONG: Do you want to go through your slides? I mean, you're pretty much done.

MR. STANONIK: Yeah. No, I'd like to go through the slides if I could.

MS. ARMSTRONG: Sure.

(Pause.)

MS. ARMSTRONG: Where do you want to start, Frank?

MR. STANONIK: Actually, if you just go to the first slide of the data because I can just talk to the slides then. That one, yeah. Oh, yeah, that's great. Good thing I passed it out.

Okay. So just to pick up --

MR. BROOKMAN: Let's stay focused, folks. Thank you.

MR. STANONIK: Just to give you a quick overview of what we thought we saw here and, first of all, yeah, you'll probably need to look at what we passed out, but let me just quickly note all of the red numbers are places where the measured UEF in our testing was higher than the measured EF, and then the blue numbers, the light blue numbers indicate where the converted UEF which was by the calculation was higher than the measured UEF. So that's what that's

about.

And the two yellow ones over there, those are actually, if I'm remembering right, those are models that are actually let's say pre-April 2015 models because we started this testing the beginning of the year. And what they're actually showing is even though they're models that are non-NAECA 3, I think in at least one case if I'm looking at the right one, they would have now become compliant I believe. Or maybe it's just in this case on the gas. Maybe we just identified a couple of non-NAECA 3 models.

In any case, so what we're seeing from this is that in the case of the gas, and this is all gas storage, but in the case of the high usage models, it appears that the measured UEF is consistently higher than both the measured EF and the converted minimum EF. And so, if nothing else, it suggests that maybe the conversion number is off. But we're not seeing a consistent relationship between the measured and converted UEF values.

One of the things we're looking at is okay, so if you have a better than minimum model, and let's say it's five points better than the minimum, then when things are converted that relationship should to some extent be maintained. It doesn't have to be five

points. It will probably be some factor of that. But the basic relationship, if the conversion factor is accurate, should be maintained. So that's one of the other things we've been trying to look at. And in this case, what we're seeing is that we're not seeing any consistent relationship between the difference between the EF measured and the converted value, the converted minimum value.

So again, if you look at one of these units. Like let's say, okay, we had -- well, let's go to the fifth unit down. So we have a unit that was certified at .67. We measured it at essentially .67. Its UEF came out roughly 7.0, 6.99. Okay. And in this case quite a bit above the converted minimum. And so this product today is five points better than the minimum standard, but when we looked at the converted stuff, it's nine points better than the minimum, okay? And again, if we were seeing that relationship hold throughout this, we'd say oh, the conversion is working. Okay? But there's not that consistency, and so that's one of the things we're looking at.

And then similarly, and I short-changed you a little bit on the handouts. We just gave you the data with the UEFs and the EFs. We did the same thing for first-hour ratings. We have those charts.

They've been submitted to DOE, they're on the docket, but they're not reproduced here. This is bad enough for your eyes.

MR. SACHS: Frank?

MR. STANONIK: Yeah.

MR. SACHS: I think I'm seeing up there and on my copy some blue numbers as well. I don't think we identified them.

MR. STANONIK: Oh, the blue ones are the situation where the UEF determined by the calculation, by the conversion calculation is higher than what we measured.

MR. SACHS: Thank you. Sorry I was hard of hearing.

MR. STANONIK: No, that's okay.

So anyhow, the last thing, and I mention it because we're also not seeing any consistent relationship between the respective measured first-hour ratings, EF procedure, UEF procedure, nor between the measured and converted first-hour rating values. Again, we're not seeing any consistency that would suggest there's a mathematical relationship.

MS. ARMSTRONG: May I ask a more fundamental question?

MR. STANONIK: Sure.

MS. ARMSTRONG: I'm not here to say we got all this right, but do you really expect to see at the end of the day a fundamental exact correlation between the old test procedure and the new on all models across the industry from different people?

MR. STANONIK: The answer to that question is no, we don't expect an exact correlation for all models.

MS. ARMSTRONG: Right. That's impossible, right?

MR. STANONIK: You're right. That's impossible and would take -- well, it's just impossible practically.

MS. ARMSTRONG: Right.

MR. STANONIK: Okay. But we do expect to see a consistent relationship for most models, and we're not seeing that. Again, to our point we think part of this is again that we really didn't have enough data to make --

MS. ARMSTRONG: I don't necessarily disagree with you. I think generally speaking we are looking to also look for consistent trends. But I think to think that there's going to be a one to one and you're not going to have things that are outside the bounds is unreasonable.

MR. STEPHENS: Well, except, can I respond to that, please? I think that generally means when you find that situation to be the case that you actually can't use a conversion factor.

MS. ARMSTRONG: Except for Congress requires one.

MR. STEPHENS: Well, I realize that, but, you know, there's this day of reckoning.

MS. ARMSTRONG: That's a different issue, right? We are required to do one. It is what it is.

MR. STEPHENS: I know, but the day of reckoning comes a year from now or so --

MS. ARMSTRONG: Exactly.

MR. STEPHENS: -- when everything has to be tested and then the only thing that matters is the tested numbers, and if they are radically different than the converted numbers in some cases and not others, then you're just staving off the problem for a year.

MS. ARMSTRONG: I don't necessarily disagree.

MR. BROOKMAN: Amy?

MS. SHEPHERD: This is Amy Shepherd from AHRI. But the other thing it requires is that the conversion factor not affect the efficiency of the

standard, and so I don't really necessarily want to interrupt Frank's flow here, but I would like to have very gently for a non-engineer an explanation of like the process that DOE used to verify that this is in fact neutral and that they met that statutory requirement.

MR. SACHS: Excuse me, please, Amy. This is Harvey. My memory, which isn't very good anymore, was that nothing that was compliant under EF would be rendered noncompliant by the UEF. Rather --

MS. SHEPHERD: Right. Like I said, gently for a non-engineer, like so there must have been -- so what were the steps in that determination?

MR. SACHS: But it doesn't require that we have the same better than minimum for any particular model.

MS. SHEPHERD: Well, the statute says it has to be neutral and not have an affect. It doesn't say neutral. It says it can't have an affect.

Now I grant you the one to one, but -- so I'm just interested in the process. DOE must have looked at this and said okay, here's how we're concluding that we met the statutory requirement of being neutral, and I'm just looking for that description, again, maybe perhaps with less math just

for me in under 10 minutes, just the process itself, the steps that were taken. But sorry, Frank.

MR. SACHS: I'm just suggesting that I'm not sure that we're defining neutral appropriately or too narrowly in terms of what can be realistically expected.

MR. BROOKMAN: Can someone answer Amy's question?

MS. ARMSTRONG: Let's go to Bruce for a second. I will.

MR. BROOKMAN: Okay. Bruce.

MR. CARNEVALE: Bruce Carnevale. The statute says the effect on efficiency requirements. "The conversion factor shall not affect the minimum efficiency requirements for covered water heaters otherwise established under this title."

MR. BROOKMAN: Thank you.

MR. CARNEVALE: And I would argue that that was an impossible task for you guys. How do you do that when you look at one for one?

MS. ARMSTRONG: So I think you saw our method that Bill presented with the yellow, green, the yellow translated to the green with the line, which is our mathematical way of trying to come up with a standard, a new standard that we believe meets the

statutory criteria. Obviously we welcome comments to that, but essentially what we've done is base it on minimally complying units and it was to safeguard in theory against that in a conservative way.

Now you could argue because we translated ratings that if the rating translation is off from the beginning because of lack of data or whatever that we need to revise our ratings translations. But I'm not sure you could come up with a -- well, there are a number of ways you could do this, but looking at the minimally compliant and moving the deltas and running a line through that minimally compliant is a way that -- it's more or less the way you conservatively do that from a mathematics standpoint.

MR. BROOKMAN: A follow-on, Amy.

MS. SHEPHERD: Not on a model basis, though. I mean, I get a percentage of the standard. I was talking more about about when you developed the conversion factor, and so you had your tested EF and you had your tested UEF and you had your conversion factor. What was that process?

MS. ARMSTRONG: Well, I mean, what he just read was the standard, was the section relevant to the standard, and so that's what I was addressing.

MR. BROOKMAN: Deriving the equation.

MS. ARMSTRONG: Exactly. How do you derive a standard equation. So --

MR. BROOKMAN: Charlie.

MR. STEPHENS: I mean, I know it's late, it's really late in the process here, and I agree with Amy about, you know, let's get it right if we can anyway. But it seems to me that the chore here, the impossible task as you called it, was to match mathematics to reality. And I don't think if you're in the process of deriving your mathematics, not using real numbers, you will never match mathematics to reality.

If you're not using the real, the actual volume of water in the tank, if you're not using the actual temperatures in the tank, if you're not using those things to do your mathematics, then you will never get reality to match up with your models. And I'm not giving up on being able to do that better. I think, you know, if you got some of those things right you actually might get better concurrence between your conversion and your measured for any given water heater, but I don't know the individual characteristics of the water heaters, so I can't really help you with that.

But the thing is, if you don't do that,

there will be, like I say, a day of reckoning where a year from now, when everybody actually has to measure it, that some units under the conversion factor that you carefully constructed will not meet the standard.

MS. ARMSTRONG: I think like in response to all these comments, in response to the discussion, in response to data, we will go back and look at everything.

I mean, when Bill explained what we did for the conversion for ratings, it was measured value. So there was a difference between the rating values, and those are also comparing tested values, single unit test to single unit test measurements. That's different than what we did for standards, which is converting ratings, converting rated values using conversion equations that were developed based on tested values. So some of your points have been well taken, but I think some of them were actually already done.

So like I said, we're going to go back and look at all this holistically and hopefully, you know, in conjunction with you guys we can come up with a revised analysis, but at the end of the day I think our methods generally hold. So that's kind of where we are. Do you want to keep going?

MR. BROOKMAN: All right. Frank, yeah, keep going.

MR. STANONIK: All right. So then still on this one, and as far as the medium usage, products in the medium usage bin, again, we have questions about the UEF measured is consistently lower -- now in this case, let me rephrase that.

In the case of the medium usage, the measured UEF is consistently lower than the measured EF. The opposite was in the case of the high bin. And that may be related to the difference between testing at 55 gallons versus 64. Maybe.

But we're also again not seeing any consistent relationship between the measured and the converted UEF values. Again, if the conversion as we look at it is accurate, and again, not perfect, but there should be some discernible relationship that you can say it's when X plus or minus something, between those two values.

Similarly, in the case of the measured first-hour rating values using the UED procedure, those come out less than the current measured first-hour rating, but again, no consistent relationship between the measured and the converted UED first-hour rating values.

All that is just causing us to say those conversion factors or calculations just don't seem to fit or the data's saying it doesn't fit.

And before we leave this one let me -- I will correct this now that I'm looking at my own paper. Those yellow ones in fact are models today that cannot be manufactured. They're lower than NAECA 3 minimums. But if you look at the result, if they were run to the new test, they would have higher ratings and in fact they would exceed the converted minimum and they could be made. So in fact you've brought in -- this proposal would bring in models that currently have been taken off the market because of NAECA 3.

So let's go to the next slide if we can, which is going to be the data for tankless models or instantaneous, whichever. We'll call them tankless. Same pattern on the numbers as far as what the colors mean.

In this case, probably the two big things we're seeing is that the same issues, we're just not seeing the relationship between the measured EF and the measured UEF. It seems to be inconsistent. And then likewise, the relationship between the measured and the converted UEF values, it doesn't seem to be

let's say jumping out at us. We're just not seeing how that's working.

In this case, we really didn't talk about it I think, but with tankless, the next one, GPM, which pretty much are not there because it's pretty straightforward. If you're heating over a 77 degree rise, you're going to get a certain GPM. If you're heating over a 70 degree rise or 67 degree rise, your GPM just goes up, it's proportional. So that's pretty straightforward. I don't think there's much problem there.

So then we can go to the next slide, which is the electric. Now, in this case, first of all, this electric storage, we're including both the resistance and heat pump products, and what we're seeing here is that the measured UEF is usually lower than the measured EF, certainly for electrical resistance products, and the measured UEF is less than both the converted minimum UEF standard and the converted UEF.

So, if you look at the last column here and if you look at just the electric resistance, all the models that have a negative there which is the difference between the measured UEF and the minimum -- I'll rephrase that.

All those units would indicate right now they're not hitting the minimum or at least suggest they're not hitting the minimum. They've come in below the converted minimum. And so that's part of our concern that, again, the conversion certainly when it comes to electrics is over -- is not converting the minimum standard properly. It's in fact increasing the stringency.

MR. BOROS: Frank, you may want to point out the low bin is especially impacted. There's only two data points there, but the low bin is really off to electric resistance models.

MR. STANONIK: Yeah. As far as the minimum absolutely, because you're going from testing an electric water heater that was providing 64 gallons to providing 38 gallons, and there should be a -- well, the tests show there is a huge difference in the measured UEF. You know, you can predict that without ever running the test because you just changed how long the resistance --

MR. STEPHENS: And the temperature too.

MR. STANONIK: A third less, right? More than a third less. Almost a half less. Yeah.

So, as Joe said, in the low ones it's particularly I would say obvious that the converted

minimums is too high.

And then in the case of the heat pumps, again, the difference between the measured UEF and the measured --

MS. ARMSTRONG: No, go back.

MR. STANONIK: Yeah, it's still there.

Is this the electronic equivalent of the hook that comes and drags you off the stage or -- all right. So, in the case again with the heat pumps, we're just seeing inconsistent results between the measured EF and the measured UEF, and as one of our members pointed out, yeah, we actually have some higher efficiency heat pumps, you know, 3.1 or whatever, and we think, again, that's an area DOE probably could look at some more models, and hopefully we can get some more models too.

All right. And then the last -- that is the last slide I think. Oh, no. Residential duty. Okay. No. How could I forget residential duty? Yeah. This one, it actually is pretty significant. Let me flip my notes here.

So, in all of these, not surprisingly, a high usage bin, and the measured UEF is higher than what the calculation would convert the UEF to in all cases, and it looks like the magnitude of the

difference actually has some relationship to a combination of the thermal efficiency of the model and the smaller volume.

But the biggest thing here again is all the UEF measured values are quite a bit above what the calculation is, which if you want to, you know, in a sense -- well, that's really saying the converted calculation is underestimating what these models will test out at when you do the UEF test, which one could say is reducing the standard I guess if you want to look at it that way.

MR. STEPHENS: You don't have the thermal efficiency --

MR. STANONIK: We have that data, yeah, measured in. They'll get it.

You know, I can answer some other questions if you have them about our data here, but as DOE said, we certainly have additional information that we can provide to help you do the analysis.

The other thing I will -- well, two things, since we're trying to conclude here I think. Two things. We still very much want a direct answer on the question of, I have models certified to DOE today that meet the April 15 standard. Units of those models manufactured after July 13, are they considered

to comply with the converted UEF standards?

MS. ARMSTRONG: What's the other thing you want to know?

MR. STANONIK: Well, the other thing is again, I mean, in concluding, we still think that that July 13 date has to move because we don't see how you can get the conversion factor final rule done in time, and as I think Amy said, we believe that it certainly is not locked in stone that it has to be July 13. I know the statute says, but things have slid in the past and we think the best solution would be that the implementation, the revised FTC labels would coincide with the effective date of the new test procedure. Is that accurate?

MR. BROOKMAN: Karen?

MS. MEYERS: Can DOE staff give us an update on where they're at in a response to the AHRI petition on rated volume?

MS. ARMSTRONG: Sure. We have gotten the comments. We are still considering the comments. We have not taken the next action, whatever that will be. We are still trying to decide exactly what our next action is going to be. And so that's the current status update.

MR. STANONIK: Is there a schedule set?

MS. ARMSTRONG: There's not a definitive schedule set. I know that there are active discussions that have been ongoing and are ongoing right now.

MR. BROOKMAN: Any additional final comments, closing remarks as we move toward closure here? Joe?

MR. BOROS: I just have one question. It's Joe Boros. AHRI submitted data which I believe, Frank, this is more than 100 sets of data, so it represents more data than what was used to establish the NOPR. What's DOE going to do with this data? Are they going to recalculate and provide additional feedback to us? What's the next steps and process with the data?

MS. ARMSTRONG: So we're definitely going to use the data. I think as a first level we need some additional information from you guys. So first off, I'll provide a template to Frank. Hopefully tomorrow he can disseminate that to you guys and get it back to us hopefully next week? I mean, it shouldn't be that difficult, right?

MR. STANONIK: Yes. Yep, yep.

MS. ARMSTRONG: And so yes, we're going to include that data in our re-analysis.

I think what's important to us, Frank, something to note is it was hard for us to tell if you were testing some units more than once in the data set you submitted or if they were distinctly all different units. The reason for that is because, at least of the three characteristics you gave us, they were identical. So it was hard for us to tell if they were all completely different models or if they were, you know, models that were the same basic models but slightly different in non-efficiency attributes. So that's the type of stuff I think some of these additional characteristics would get to or if they were just the same unit tested multiple times.

MR. STANONIK: Right. Okay.

MS. ARMSTRONG: But long story short, we are going to revise the analysis. Now whether we're going to put that analysis out for additional comment or whether we're going to go final with it, I don't think we know yet. It depends on what that whole re-analysis process, what it shows.

That being said, if you guys as an industry and other entities would like an additional opportunity to discuss things with us or continue that dialogue, I think we can find a way to do it, but it needs to be in a pretty timely manner.

MR. STANONIK: Frank Stanonik, AHRI. Just quickly in answer to that question, certainly the tests that were done as part of our program signal test unit. We mixed in data members provided. Some of that might be repetitive tests on the same model or same unit. We'll identify them.

MS. ARMSTRONG: And I think some of them are also going to be units that we tested. So I know that you may not share manufacturer model-specific characteristics, but I will say to the extent that manufacturers want to better understand if we tested some of their specific products and what those results might be, we have ways of disclosing that that are not part of the public record, because we're not going to put full test reports in the document on every unit we tested. But it would go two ways. You would have to be willing to also share with us that data on that specific unit.

MR. BROOKMAN: Harvey.

MR. SACHS: Several things I want to say in closing remarks. First of all, I think all of us owe each other a bit of an apology that everyone involved in the sausage-making for AEMTCA probably underestimated the effort that would be required to do this conversion process. I realize that points

fingers back at some of us on the advocate side as well as some manufacturers and others.

In that context, I really want to say how much I appreciate all the hard work that both DOE consultants and manufacturers with AHRI have done to try to get this right.

With those things said, it seems to me that there are two paths forward, and I haven't been able to think of a third path that would be at all responsive to the time demands, the effort demands, and everything else that everyone is under.

One of them is a process we've spent a lot of time on today, which is to keep massaging, keep trying to reduce the variability and understand the anomalies in the conversion process, to get a single representation which clearly would be an ideal thing for consumers.

The other path, which I think may be possible, but I could be wrong, is say okay, this is a transition time between now and next year in May. The least confusion might be to allow continued representation in EF and TE units for existing models and require UEF for all models certified after the date certain, July 13, recognizing that this will mean there are two labels out there. There is the

possibility of confusion, but it will go away. And it may be the least bad approach that is available to us now.

So I'm just suggesting that we might have a choice and it might be that that's the less painful choice. ACEEE does not endorse that position at this time.

(Laughter.)

MR. BROOKMAN: Final comments?

(No response.)

MR. BROOKMAN: Okay. Then turning it back to Ashley for how to submit written comments.

MS. ARMSTRONG: So you guys all know how to submit written comments at this point in time. The comment period closes on June 15. I don't think DOE plans to extend that further at least as of now.

That being said, we would like to thank you guys for coming today and participating and for all the feedback. We will work hard to do some revisions to the analysis and see where that lands us. So safe travels home.

MR. BROOKMAN: Thank you all.

ALL: Thanks.

(Whereupon, at 1:44 p.m., the meeting in the above-entitled matter was concluded.)

REPORTER'S CERTIFICATE

DOCKET NO.: N/A

CASE TITLE: The Test Procedures for Residential and Certain Commercial Water Heaters -- Conversion Factors Rulemaking Meeting

HEARING DATE: May 28, 2015

LOCATION: Washington, D.C.

I hereby certify that the proceedings and evidence are contained fully and accurately on the tapes and notes reported by me at the hearing in the above case before the U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy.

Date: May 28, 2015

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